ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, January 2, 2024 12:22:58 PM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240102_122258.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.57	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.009	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.01	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.37	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.06	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, January 2, 2024 10:10:22 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240102_101022.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.4	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2848.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.2	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.8	Pass
Peak at 907.0 (cm-1)	908.0	906.0	905.5	**Fail**
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	107.00	**Fail**
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	6	**Fail**
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.56	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.008	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.29	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.05	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, January 8, 2024 8:35:47 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240108_083547.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.33	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.55	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.015	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.53	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.09	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, January 18, 2024 8:08:35 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240118_080835.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.58	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.007	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.01	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.31	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.05	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, January 22, 2024 11:10:22 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240122_111022.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.57	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.007	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.20	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.02	Pass
Intercept (%T)	1.00	-1.00	0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Wednesday, January 31, 2024 11:16:20 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240131_111620.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.57	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.006	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.01	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.15	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.001	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.03	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, February 5, 2024 12:40:17 PM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240205_124017.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.56	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.008	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.01	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.17	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.03	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, February 12, 2024 8:26:14 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240212_082614.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.59	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.017	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.16	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.004	Pass
RMS noise 550 - 450	0.30	0.00	0.03	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.05	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Wednesday, February 21, 2024 9:33:17 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240221_093317.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.02	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.58	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.007	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.13	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.001	Pass
RMS noise 1050 - 950	0.014	0.00	0.004	Pass
RMS noise 550 - 450	0.30	0.00	0.02	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.06	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Wednesday, February 21, 2024 12:34:57 PM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240221_123457.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.02	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.59	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.007	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.23	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, February 27, 2024 7:33:18 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240227_073318.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.60	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.007	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.01	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.22	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, March 4, 2024 9:24:20 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240304_092420.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.02	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.37	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.60	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.011	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.03	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.28	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.005	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.04	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, March 18, 2024 8:29:32 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240318_082932.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.02	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.02	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.60	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.011	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.26	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.005	Pass
RMS noise 550 - 450	0.30	0.00	0.05	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.04	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, March 12, 2024 1:03:02 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240312_130302.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.58	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.010	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.23	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.004	Pass
RMS noise 550 - 450	0.30	0.00	0.05	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, April 9, 2024 1:15:09 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240409_131509.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.63	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.04	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.015	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.37	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.007	Pass
RMS noise 550 - 450	0.30	0.00	0.07	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.3	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, March 25, 2024 11:45:04 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240325_114504.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.59	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.011	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.03	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.27	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.006	Pass
RMS noise 550 - 450	0.30	0.00	0.05	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.04	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, April 4, 2024 1:32:32 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240404_133232.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.63	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.016	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.05	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.39	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.008	Pass
RMS noise 550 - 450	0.30	0.00	0.07	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, April 4, 2024 11:59:33 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240404_115933.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.7	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.0	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.2	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1030.3	**Fail**
Peak at 907.0 (cm-1)	908.0	906.0	907.2	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	0.00	**Fail**
Resolution 1589 - 1583 (%T)	100.00	12.00	0.00	**Fail**
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	0	**Fail**
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.63	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.020	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.03	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.24	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.007	Pass
RMS noise 550 - 450	0.30	0.00	0.05	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.04	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, April 15, 2024 7:39:01 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240415_073901.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.7	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.2	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.7	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.8	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.2	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.1	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.04	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.8	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.2	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.7	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.65	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.04	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.021	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.05	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.29	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.005	Pass
RMS noise 1050 - 950	0.014	0.00	0.009	Pass
RMS noise 550 - 450	0.30	0.00	0.07	Pass

PV Detector linearity

Slope	1.10	0.90	0.98	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.8	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.1	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Wednesday, April 24, 2024 2:04:34 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240424_140434.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.7	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.03	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.01	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.02	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.7	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.68	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.05	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.021	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.06	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.46	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.005	Pass
RMS noise 1050 - 950	0.014	0.00	0.013	Pass
RMS noise 550 - 450	0.30	0.00	0.10	Pass

PV Detector linearity

Slope	1.10	0.90	0.96	Pass
Intercept (%T)	1.00	-1.00	-0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, April 29, 2024 8:23:55 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240429_082355.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.04	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.02	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.74	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.09	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.043	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.12	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	1.20	Pass
RMS noise 4050 - 3950	0.05	0.00	0.02	Pass
RMS noise 2050 - 1950	0.039	0.00	0.011	Pass
RMS noise 1050 - 950	0.014	0.00	0.031	**Fail**
RMS noise 550 - 450	0.30	0.00	0.23	Pass

PV Detector linearity

Slope	1.10	0.90	0.98	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, April 30, 2024 7:47:43 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240430_074743.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.7	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.03	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.01	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.07	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.12	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.7	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.32	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.54	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.12	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.091	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.23	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	1.28	Pass
RMS noise 4050 - 3950	0.05	0.00	0.03	Pass
RMS noise 2050 - 1950	0.039	0.00	0.018	Pass
RMS noise 1050 - 950	0.014	0.00	0.045	**Fail**
RMS noise 550 - 450	0.30	0.00	0.26	Pass

PV Detector linearity

Slope	1.10	0.90	1.13	**Fail**
Intercept (%T)	1.00	-1.00	0.26	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, May 9, 2024 3:00:08 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240509_150008.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.37	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.47	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.021	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.09	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.42	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.010	Pass
RMS noise 550 - 450	0.30	0.00	0.06	Pass

PV Detector linearity

Slope	1.10	0.90	1.03	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, May 13, 2024 11:39:06 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240513_113906.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.02	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.47	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.009	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.65	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.008	Pass
RMS noise 550 - 450	0.30	0.00	0.10	Pass

PV Detector linearity

Slope	1.10	0.90	1.02	Pass
Intercept (%T)	1.00	-1.00	-0.04	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, May 23, 2024 1:48:53 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240523_134853.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.12	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.33	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.43	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.031	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.05	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.21	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.006	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.03	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, May 28, 2024 12:50:40 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240528_125040.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.12	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.45	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.033	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.03	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.23	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.005	Pass
RMS noise 1050 - 950	0.014	0.00	0.006	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.03	Pass
Intercept (%T)	1.00	-1.00	0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, June 4, 2024 9:49:52 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240604_094952.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.47	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.014	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.52	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.007	Pass
RMS noise 550 - 450	0.30	0.00	0.08	Pass

PV Detector linearity

Slope	1.10	0.90	1.02	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, June 4, 2024 8:23:31 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240604_082331.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.47	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.013	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.11	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	0.19	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.015	**Fail**
RMS noise 550 - 450	0.30	0.00	0.03	Pass

PV Detector linearity

Slope	1.10	0.90	1.02	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, June 13, 2024 8:08:22 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240613_080822.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.47	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.022	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.08	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.23	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.011	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.02	Pass
Intercept (%T)	1.00	-1.00	-0.04	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, June 17, 2024 8:07:38 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240617_080738.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.48	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.010	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.08	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.24	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.012	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.03	Pass
Intercept (%T)	1.00	-1.00	-0.04	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, June 27, 2024 8:02:17 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240627_080217.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.7	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.1	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.04	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	-0.01	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.03	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.02	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.5	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.12	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.32	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.40	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.15	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.101	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.27	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	1.26	Pass
RMS noise 4050 - 3950	0.05	0.00	0.03	Pass
RMS noise 2050 - 1950	0.039	0.00	0.023	Pass
RMS noise 1050 - 950	0.014	0.00	0.051	**Fail**
RMS noise 550 - 450	0.30	0.00	0.21	Pass

PV Detector linearity

Slope	1.10	0.90	1.29	**Fail**
Intercept (%T)	1.00	-1.00	0.27	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.1	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Friday, June 28, 2024 7:54:13 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240628_075413.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.08	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	-0.01	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.03	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.05	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.42	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.09	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.060	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.45	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	1.05	Pass
RMS noise 4050 - 3950	0.05	0.00	0.03	Pass
RMS noise 2050 - 1950	0.039	0.00	0.013	Pass
RMS noise 1050 - 950	0.014	0.00	0.067	**Fail**
RMS noise 550 - 450	0.30	0.00	0.23	Pass

PV Detector linearity

Slope	1.10	0.90	1.23	**Fail**
Intercept (%T)	1.00	-1.00	0.04	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.2	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Friday, June 28, 2024 5:39:04 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240628_173904.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.7	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.2	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.25	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	-0.03	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.07	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.5	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.12	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	4.17	**Fail**
Energy ratio 2000 / 1000	4.00	0.80	0.13	**Fail**

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.47	**Fail**
P-P noise 2050 - 1950 (%T)	0.221	0.00	2.216	**Fail**
P-P noise 1050 - 950 (%T)	0.10	0.00	0.48	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	4.11	**Fail**
RMS noise 4050 - 3950	0.05	0.00	0.09	**Fail**
RMS noise 2050 - 1950	0.039	0.00	0.448	**Fail**
RMS noise 1050 - 950	0.014	0.00	0.100	**Fail**
RMS noise 550 - 450	0.30	0.00	0.84	**Fail**

PV Detector linearity

Slope	1.10	0.90	1.03	Pass
Intercept (%T)	1.00	-1.00	-0.09	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.1	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, July 1, 2024 8:45:36 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240701_084536.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.06	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.02	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.42	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.12	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.083	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.35	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	1.73	**Fail**
RMS noise 4050 - 3950	0.05	0.00	0.03	Pass
RMS noise 2050 - 1950	0.039	0.00	0.017	Pass
RMS noise 1050 - 950	0.014	0.00	0.042	**Fail**
RMS noise 550 - 450	0.30	0.00	0.26	Pass

PV Detector linearity

Slope	1.10	0.90	1.20	**Fail**
Intercept (%T)	1.00	-1.00	0.07	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.3	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, July 15, 2024 12:51:49 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240715_125149.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.12	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.01	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.03	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.5	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.32	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.50	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.15	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.076	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.37	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	1.57	**Fail**
RMS noise 4050 - 3950	0.05	0.00	0.03	Pass
RMS noise 2050 - 1950	0.039	0.00	0.017	Pass
RMS noise 1050 - 950	0.014	0.00	0.068	**Fail**
RMS noise 550 - 450	0.30	0.00	0.26	Pass

PV Detector linearity

Slope	1.10	0.90	1.17	**Fail**
Intercept (%T)	1.00	-1.00	0.07	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, July 16, 2024 2:23:00 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240716_142300.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.8	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.08	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.01	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.55	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.12	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.089	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.47	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	0.93	Pass
RMS noise 4050 - 3950	0.05	0.00	0.03	Pass
RMS noise 2050 - 1950	0.039	0.00	0.020	Pass
RMS noise 1050 - 950	0.014	0.00	0.079	**Fail**
RMS noise 550 - 450	0.30	0.00	0.21	Pass

PV Detector linearity

Slope	1.10	0.90	1.12	**Fail**
Intercept (%T)	1.00	-1.00	0.16	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, July 25, 2024 12:59:30 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240725_125930.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.01	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.49	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.05	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.042	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.25	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	0.77	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.007	Pass
RMS noise 1050 - 950	0.014	0.00	0.039	**Fail**
RMS noise 550 - 450	0.30	0.00	0.13	Pass

PV Detector linearity

Slope	1.10	0.90	1.04	Pass
Intercept (%T)	1.00	-1.00	-0.06	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, July 25, 2024 1:11:13 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240725_131113.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.03	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.03	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.50	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.019	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.05	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.74	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.012	Pass
RMS noise 550 - 450	0.30	0.00	0.15	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, July 29, 2024 12:05:47 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240729_120547.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.4	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.50	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.006	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.01	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.12	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.001	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.02	Pass

PV Detector linearity

Slope	1.10	0.90	1.04	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, August 5, 2024 7:12:19 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240805_071219.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.4	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1600.9	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.12	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.49	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.015	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.01	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.07	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.02	Pass

PV Detector linearity

Slope	1.10	0.90	1.05	Pass
Intercept (%T)	1.00	-1.00	0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1600.9	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Wednesday, August 14, 2024 10:25:03 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240814_102503.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.33	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.49	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.008	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.11	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.004	Pass
RMS noise 550 - 450	0.30	0.00	0.02	Pass

PV Detector linearity

Slope	1.10	0.90	1.03	Pass
Intercept (%T)	1.00	-1.00	-0.06	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, August 19, 2024 1:32:05 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240819_133205.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.3	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.33	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.49	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.009	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.15	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.004	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.03	Pass
Intercept (%T)	1.00	-1.00	-0.07	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, August 26, 2024 3:31:57 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240826_153157.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.51	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.04	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.044	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.01	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.12	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.010	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.03	Pass

PV Detector linearity

Slope	1.10	0.90	1.03	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, September 3, 2024 3:34:04 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240903_153404.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.3	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.5	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.3	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.02	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.36	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.53	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.008	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.01	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.08	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.02	Pass

PV Detector linearity

Slope	1.10	0.90	1.03	Pass
Intercept (%T)	1.00	-1.00	0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.5	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, September 12, 2024 10:04:14 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240912_100414.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.51	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.02	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.015	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.13	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.004	Pass
RMS noise 550 - 450	0.30	0.00	0.03	Pass

PV Detector linearity

Slope	1.10	0.90	1.02	Pass
Intercept (%T)	1.00	-1.00	0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.3	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.4	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Wednesday, September 18, 2024 9:14:51 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240918_091451.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.52	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.013	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.11	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.002	Pass
RMS noise 1050 - 950	0.014	0.00	0.005	Pass
RMS noise 550 - 450	0.30	0.00	0.03	Pass

PV Detector linearity

Slope	1.10	0.90	1.02	Pass
Intercept (%T)	1.00	-1.00	-0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.9	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.3	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, September 24, 2024 9:20:34 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20240924_092034.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.52	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.01	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.013	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.12	Pass
RMS noise 4050 - 3950	0.05	0.00	0.00	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.003	Pass
RMS noise 550 - 450	0.30	0.00	0.02	Pass

PV Detector linearity

Slope	1.10	0.90	1.02	Pass
Intercept (%T)	1.00	-1.00	0.00	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, October 1, 2024 11:13:57 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241001_111357.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.5	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.0	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.02	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.32	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.50	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.04	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.035	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.02	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.17	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.008	Pass
RMS noise 1050 - 950	0.014	0.00	0.005	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, October 7, 2024 12:16:17 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241007_121617.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.6	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.33	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.51	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.04	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.020	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.21	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.008	Pass
RMS noise 550 - 450	0.30	0.00	0.05	Pass

PV Detector linearity

Slope	1.10	0.90	1.01	Pass
Intercept (%T)	1.00	-1.00	0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.6	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.3	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, October 17, 2024 10:06:05 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241017_100605.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.02	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.32	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.55	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.016	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.03	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.28	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.007	Pass
RMS noise 550 - 450	0.30	0.00	0.05	Pass

PV Detector linearity

Slope	1.10	0.90	0.97	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, October 21, 2024 7:55:31 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241021_075531.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.3	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.1	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1600.8	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.2	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.5	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	36.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.2	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.0	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1600.9	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.8	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.3	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.2	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	36.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.32	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.02	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.02	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.2	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1600.8	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.2	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.5	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	4.45	**Fail**
Energy ratio 2000 / 1000	4.00	0.80	0.14	**Fail**

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.13	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.830	**Fail**
P-P noise 1050 - 950 (%T)	0.10	0.00	0.21	**Fail**
P-P noise 550 - 450 (%T)	1.50	0.00	2.57	**Fail**
RMS noise 4050 - 3950	0.05	0.00	0.03	Pass
RMS noise 2050 - 1950	0.039	0.00	0.176	**Fail**
RMS noise 1050 - 950	0.014	0.00	0.041	**Fail**
RMS noise 550 - 450	0.30	0.00	0.47	**Fail**

PV Detector linearity

Slope	1.10	0.90	0.99	Pass
Intercept (%T)	1.00	-1.00	-0.05	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.2	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.1	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.2	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1600.8	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1582.8	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.3	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.2	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, October 29, 2024 9:52:35 AM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241029_095235.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.7	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.57	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.014	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.31	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.008	Pass
RMS noise 550 - 450	0.30	0.00	0.07	Pass

PV Detector linearity

Slope	1.10	0.90	0.96	Pass
Intercept (%T)	1.00	-1.00	0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Wednesday, October 30, 2024 12:05:49 PM (GMT-05:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241030_120549.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.04	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.7	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.33	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.56	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.04	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.031	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.32	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.006	Pass
RMS noise 1050 - 950	0.014	0.00	0.007	Pass
RMS noise 550 - 450	0.30	0.00	0.06	Pass

PV Detector linearity

Slope	1.10	0.90	0.96	Pass
Intercept (%T)	1.00	-1.00	-0.04	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.3	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, November 4, 2024 9:04:00 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241104_090400.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.02	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.02	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.32	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.55	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.035	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.03	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.32	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.006	Pass
RMS noise 1050 - 950	0.014	0.00	0.006	Pass
RMS noise 550 - 450	0.30	0.00	0.06	Pass

PV Detector linearity

Slope	1.10	0.90	0.95	Pass
Intercept (%T)	1.00	-1.00	-0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, November 12, 2024 9:09:40 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241112_090940.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.7	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.02	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.03	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.7	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.33	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.56	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.016	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.17	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.009	Pass
RMS noise 550 - 450	0.30	0.00	0.04	Pass

PV Detector linearity

Slope	1.10	0.90	0.95	Pass
Intercept (%T)	1.00	-1.00	0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, November 19, 2024 6:50:35 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241119_065035.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.7	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.58	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.05	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.048	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.35	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.009	Pass
RMS noise 1050 - 950	0.014	0.00	0.009	Pass
RMS noise 550 - 450	0.30	0.00	0.07	Pass

PV Detector linearity

Slope	1.10	0.90	0.95	Pass
Intercept (%T)	1.00	-1.00	0.01	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, November 25, 2024 12:54:31 PM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241125_125431.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	24.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.01	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.44	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.58	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.015	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.03	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.32	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.008	Pass
RMS noise 550 - 450	0.30	0.00	0.06	Pass

PV Detector linearity

Slope	1.10	0.90	0.95	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.0	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Tuesday, December 3, 2024 10:46:39 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241203_104639.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.4	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.7	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	-0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.01	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.01	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.00	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.7	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.60	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.017	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.25	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.009	Pass
RMS noise 550 - 450	0.30	0.00	0.05	Pass

PV Detector linearity

Slope	1.10	0.90	0.96	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, December 12, 2024 2:05:30 PM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241212_140530.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	-0.03	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	-0.03	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.33	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.58	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.04	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.017	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.05	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.63	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.013	Pass
RMS noise 550 - 450	0.30	0.00	0.12	Pass

PV Detector linearity

Slope	1.10	0.90	0.97	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Thursday, December 19, 2024 8:22:32 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241219_082232.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.7	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.4	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.6	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.02	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.00	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.01	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.35	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.60	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.04	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.015	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.31	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.003	Pass
RMS noise 1050 - 950	0.014	0.00	0.009	Pass
RMS noise 550 - 450	0.30	0.00	0.07	Pass

PV Detector linearity

Slope	1.10	0.90	0.96	Pass
Intercept (%T)	1.00	-1.00	-0.02	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.4	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.

ValPro Qualification Report

Qualification test: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV
Operator: OMNICAdmin
Date: Monday, December 23, 2024 7:56:59 AM (GMT-06:00)
Instrument: Nicolet iS20 Serial number: BEP2210424
Filename: Nicolet iS20 KBr - Factory (CP,JP,PHEUR,PV,USP) - PV_20241223_075659.spg

Test description	High limit	Low limit	Measured	Result
CP Wavenumber accuracy				
Peak at 3027.0 (cm-1)	3032.0	3022.0	3025.6	Pass
Peak at 2851.0 (cm-1)	2856.0	2846.0	2849.5	Pass
Peak at 1601.0 (cm-1)	1602.0	1600.0	1601.1	Pass
Peak at 1028.0 (cm-1)	1029.0	1027.0	1028.4	Pass
Peak at 907.0 (cm-1)	908.0	906.0	906.6	Pass
CP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
CP Peak Resolution				
Peaks between 3120 and 2850 cm-1	7	7	7	Pass
JP Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.5	3058.5	3059.7	Pass
Peak at 2849.5 (cm-1)	2851.0	2848.0	2849.5	Pass
Peak at 1942.9 (cm-1)	1944.4	1941.4	1942.5	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
JP Optical resolution				
Resolution 2870 - 2849.5 (%T)	100.00	18.00	37.00	Pass
Resolution 1589 - 1583 (%T)	100.00	12.00	25.00	Pass
JP Repeatability				
Peak at 3027.1 (cm-1)	5.00	-5.00	0.00	Pass
Peak at 1028.3 (cm-1)	1.00	-1.00	0.00	Pass
Intensity at 2849.5 (%T)	0.50	-0.50	0.03	Pass
Intensity at 1028.3 (%T)	0.50	-0.50	0.03	Pass
PHEUR Wavenumber accuracy				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass
Peak at 906.6 (cm-1)	907.6	905.6	906.6	Pass
PHEUR Optical resolution				
Resolution 2870 - 2849.5 (Abs)	10.00	0.33	0.45	Pass
Resolution 1589 - 1583 (Abs)	10.00	0.08	0.13	Pass
PV Energy ratio				
Energy ratio 4000 / 2000	1.00	0.20	0.34	Pass
Energy ratio 2000 / 1000	4.00	0.80	1.58	Pass

PV Noise level

P-P noise 4050 - 3950 (%T)	0.25	0.00	0.03	Pass
P-P noise 2050 - 1950 (%T)	0.221	0.00	0.017	Pass
P-P noise 1050 - 950 (%T)	0.10	0.00	0.04	Pass
P-P noise 550 - 450 (%T)	1.50	0.00	0.24	Pass
RMS noise 4050 - 3950	0.05	0.00	0.01	Pass
RMS noise 2050 - 1950	0.039	0.00	0.004	Pass
RMS noise 1050 - 950	0.014	0.00	0.008	Pass
RMS noise 550 - 450	0.30	0.00	0.06	Pass

PV Detector linearity

Slope	1.10	0.90	0.97	Pass
Intercept (%T)	1.00	-1.00	-0.03	Pass

USP Wavenumber accuracy

Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.7	Pass
Peak at 2849.5 (cm-1)	2850.5	2848.5	2849.5	Pass
Peak at 1942.9 (cm-1)	1943.9	1941.9	1942.4	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.1	Pass
Peak at 1583.0 (cm-1)	1584.0	1582.0	1583.0	Pass
Peak at 1154.5 (cm-1)	1155.5	1153.5	1154.5	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.4	Pass

Performed by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

Comments: _____

Digital comment(s):
No digital comments found.