

Appendix 1. Mineral localities and chemical classifications with CL spectral data.

The CL spectral data reported in this table are calculated averages of six replicate samples/grains of each feldspar source. The chemical composition reported is based on μ XRF analysis (in two orientations per grain) of the exact same six replicate grains of each feldspar source on which the CL spectra data were acquired. Other techniques noted were used for confirmation and analysis may not have been performed using the same grains as those on which CL spectra were acquired (see Methods section in paper for more details).

Sample	Location	Geologic Origin	Chemical Classification in mol % of K+Na+Ca	Peak Centroid (nm)	Error (nm)	FWHM (nm)
F1	Amelia, Amelia County, Virginia	Pegmatite	Alkali ^{2,4}	432.7	0.9	42.7
			Or 78.5 ± 3.7	494.1	0.4	30.1
			Ab 21.4 ± 3.7	515.7	1.1	92.5
			An 0.1 ± 0.2	865.2	2.4	100.8
F2	Barringer Hill, Llano County, Texas	Pegmatite	Alkali ^{2,4}	436.5	2.4	48.6
			Or 61.7 ± 3.7	502.4	2.2	59.2
			Ab 37.2 ± 3.2	579.2	3.1	75.9
			An 1.1 ± 0.9	704.9	4.5	80.3
F3	Keystone, Pennington, South Dakota	Pegmatite	Alkali ^{2,4}	443.5	3.6	60.5
			Or 84.5 ± 2.0	494.2	3.0	32.6
			Ab 14.5 ± 2.3	572.4	5.0	79.9
			An 1.0 ± 1.2			
F4	Mineral Mountains, Milford, Beaver County, Utah	Pegmatite	Alkali ^{2,4}	440.7	1.5	53.6
			Or 78.9 ± 3.3	497.3	2.4	47.6
			Ab 20.9 ± 3.5	560.1	6.9	86.7
			An 0.2 ± 0.4	697.3	5.8	44.5
F5	Mitchell Creek Mica Mine, Upson County, Georgia	Unknown	Alkali ^{2,4}	426.3	2.1	45.5
			Or 75.3 ± 2.7	495.8	1.1	35.9
			Ab 24.1 ± 2.5	528.8	13.1	116.7
			An 0.7 ± 0.7	852.3	2.3	105.4

F6	Silver City District, 82 km SW Boise, Owyhee County, Idaho	Pegmatite	Alkali ^{2,4} Or 85.5 ± 2.0 Ab 14.5 ± 2.0 An 0.0 ± 0.0	574.2	4.3	161.7
F8	Tourmaline Queen Mine, Pala, San Diego County, California	Pegmatite	Alkali ^{2,4} Or 81.2 ± 2.4 Ab 16.8 ± 1.4 An 2.0 ± 2.0	578.1	5.8	135.1
F9	near Wright Creek Ranch, WSW of Peach Springs, Mohave County, Arizona	Pegmatite	Alkali ² Or 81.8 ± 2.5 Ab 17.9 ± 2.0 An 0.3 ± 0.6	436.6 500.9 572.5 685.2	4.2 3.4 5.1 1.0	58.0 54.3 84.3 78.7
F10	Pike's Peak, Park/Teller County, Colorado	Unknown	Alkali ^{2,4} Or 84.1 ± 2.4 Ab 15.7 ± 2.5 An 0.2 ± 0.4	434.9 493.1 525.0 693.2 859.1	1.6 0.3 3.0 2.5 0.8	54.7 30.9 102.1 88.1 73.3
F11	Mineral Hill, Delaware County, Pennsylvania	Pegmatite	Alkali ^{2,4} Or 71.9 ± 11.5 Ab 27.6 ± 11.2 An 0.5 ± 0.5	437.6 495.7 539.9 706.7 849.2	3.4 1.8 14.8 7.9 2.0	53.6 39.4 103.6 78.2 87.9
F12	Bayer-Mingolla quarry, Ashland, Middlesex County, Massachusetts	Unknown	Andesine ^{2,4} Or 2.4 ± 1.1 Ab 53.8 ± 3.3 An 43.9 ± 3.4	444.0 487.9 563.7 703.6	2.5 0.3 4.4 4.1	69.0 27.3 79.6 101.8

F13	Franklin Mine, Franklin, Sussex County, New Jersey	Unknown	Alkali ^{2,4} Or 64.3 ± 8.4 Ab 35.5 ± 8.6 An 0.3 ± 0.4	438.1 507.3 576.3 713.3	4.2 8.0 15.5 6.5	47.1 62.8 71.5 77.5
F14	Moat Mountain, North Conway, Carroll County, New Hampshire	Unknown	Alkali ^{2,4} Or 84.4 ± 3.3 Ab 15.4 ± 3.3 An 0.2 ± 0.4	580.1	3.1	153.9
F15	Valenciana Mine, Guanajuato, Mexico	Pegmatite	Alkali ^{2,4} Or 86.3 ± 1.5 Ab 13.0 ± 1.5 An 0.8 ± 1.2	583.2	4.8	166.6
F16	Barstow, San Bernardino County, California	Hydrothermal Ore	Alkali ^{2,4} Or 85.1 ± 2.6 Ab 13.1 ± 2.6 An 1.8 ± 1.2	427.5 549.5 589.2 686.4	0.9 5.2 4.2 0.9	42.1 112.8 53.5 79.8
F17	Deer Park Mine, near Penland, Mitchell County, North Carolina	Unknown	Alkali ^{2,4} Or 78.2 ± 7.0 Ab 21.4 ± 6.0 An 0.4 ± 0.6	432.7 495.3 535.2 702.4 865.6	2.3 0.4 7.1 10.7 5.7	53.5 35.1 117.5 80.7 93.0
F18	Valhalla, Westchester County, New York	Unknown	Alkali ^{2,4} Or 82.5 ± 6.9 Ab 17.2 ± 6.9 An 0.3 ± 0.4	445.6 497.5 561.4 689.3 858.5	1.8 1.1 5.5 4.0 4.0	63.6 43.2 98.9 81.0 96.8
F19	3 km SE of Globe, Gila County, Arizona	Unknown	Alkali ^{2,4} Or 84.2 ± 4.3 Ab 13.9 ± 1.5 An 1.9 ± 3.0	457.3 512.4 599.6	30/8 16.4 13.2	66.0 139.2 126.7
F20	West Maroon Pass, Gothic, Pitkin County, Colorado	Unknown	Alkali ^{2,4} Or 68.0 ± 6.6 Ab 20.9 ± 3.4 An 11.0 ± 8.7	432/4 515.2 591.6 685.7	3.7 6.1 8.1 1.3	50.0 77.1 70.9 85.5

F21	Pikes Peak Massif, Colorado	Pegmatite	Albite ^{2,4}	432.2	3.2	54.6
			Or 1.6 ± 1.0	499.3	8.9	50.6
			Ab 98.2 ± 0.9	582.9	5.0	118.3
			An 0.2 ± 0.3	716.6	2.1	74.0
F22	Crystal Peak, Florissant County, Colorado	Pegmatite	Albite ^{2,4}	435.5	4.3	56.0
			Or 1.9 ± 1.7	496.9	6.7	45.3
			Ab 97.8 ± 1.7	571.0	7.7	100.0
			An 0.3 ± 0.4	717.2	3.7	73.4
F23	Bennett Quarry, Newry, Oxford County, Maine	Pegmatite	Albite ^{2,4}	422.5	4.6	85.5
			Or 2.4 ± 0.9	557.5	1.9	60.3
			Ab 96.8 ± 1.0	642.1	9.3	63.9
			An 0.8 ± 0.6	703.2	3.5	69.0
F24	Rutherford Mine, Amelia, Amelia County, Virginia	Pegmatite	Albite ^{2,4}	439.4	11.1	135.4
			Or 1.9 ± 1.3	555.7	1.1	62.9
			Ab 97.2 ± 1.8	637.5	9.9	55.7
			An 0.8 ± 0.8	717.5	12.4	64.5
F25	Pala Chief Mine, Romona District-Pala, San Diego County, California	Pegmatite	Albite ^{2,4}	410.0	9.2	29.1
			Or 1.6 ± 1.3	458.5	22.2	23.7
			Ab 97.7 ± 1.1	567.6	7.7	101.7
			An 0.7 ± 0.7			
F26	Himalaya Mine, Mesa Grande District, San Diego County, California	Pegmatite	Albite ^{2,4}	434.3	0.0	57.8
			Or 2.0 ± 1.1	496.2	0.0	52.1
			Ab 95.2 ± 2.1	564.5	3.7	73.9
			An 2.7 ± 1.5	645.4	8.3	84.5
				737.1	0.3	88.1
F27	Fine, St. Lawrence County, New York	Pegmatite	Oligoclase ^{2,4}	445.1	5.0	64.4
			Or 5.1 ± 1.2	500.1	1.7	44.1
			Ab 67.6 ± 4.2	574.6	1.5	98.7
			An 27.4 ± 3.2	716.1	2.3	85.6

F28	Bakersville, Mitchell County, North Carolina	Unknown	Andesine ² Or 4.3 ± 0.5 Ab 62.6 ± 3.0 An 33.1 ± 2.6	582.9 708.4	0.6 3.4	61.1 72.5
F29	Mt. Mica, Paris, Oxford County, Maine	Pegmatite	Albite ² Or 2.2 ± 1.0 Ab 95.8 ± 2.2 An 2.0 ± 1.7	436.8 497.7 568.0 684.3	6.1 3.0 5.0 7.1	77.2 40.0 62.8 97.7
F30	Nain Rock Complex, St. Paul Island (Labrador Penninsula), Newfoundland, Canada	Pegmatite	Labradorite ^{2,4} Or 3.9 ± 1.2 Ab 35.0 ± 2.0 An 61.2 ± 2.5	492.1 565.5 720.1	2.9 1.6 3.8	47.5 68.4 109.4
F31	Sagebrush Flats, Lake County, Oregon	Unknown	Bytownite/ Labradorite ^{2,4} Or 1.8 ± 1.1 Ab 27.1 ± 2.9 An 71.1 ± 3.0	411.9 528.5 563.8 688.3	1.1 16.1 1.5 4.0	41.3 103.4 61.7 105.7
F32	Nuevos Casas Grande, Chihuahua, Mexico	Unknown	Labradorite/ Bytownite ^{2,4} Or 2.7 ± 0.9 Ab 28.2 ± 2.2 An 69.1 ± 2.6	447.8 496.1 558.5 688.9	3.8 2.1 1.8 4.9	68.9 39.9 69.8 109.7
F33	Crystal Bay, Minnesota	Unknown	Bytownite ^{2,4} Or 0.9 ± 0.7 Ab 22.9 ± 5.7 An 76.3 ± 5.7	448.8 492.7 556.0 677.1	3.0 0.9 0.8 3.0	72.7 35.1 66.8 103.6
F34	Ponderosa Mine, Burns, Harney County, Oregon	Volcanic	Bytownite ² Or 1.3 ± 0.6 Ab 24.8 ± 3.5 An 73.9 ± 3.6	420.3 516.2 562.1 678.2	17.2 21.1 2.7 4.0	51.8 114.2 64.4 105.3

F35	Bytown, Ottawa, Ontario	Unknown	Labradorite ^{2,4}	446.6	4.1	69.5
			Or 7.1 ± 1.9	487.2	1.4	25.7
			Ab 29.9 ± 4.5	557.1	8.2	83.8
			An 63.1 ± 5.2	702.4	11.1	103.9
F36	Adirondack Mountains, New York	Unknown	Labradorite ^{2,4}	437.4	2.1	60.6
			Or 5.0 ± 1.2	485.7	2.2	27.4
			Ab 30.3 ± 2.5	557.7	2.2	78.6
			An 64.7 ± 3.1	712.2	2.4	99.1
Ward's- Orthoclase	India	Unknown	Alkali ^{1, 2, 3}	435.0	3.7	55.0
			Or 68.8 ± 4.2	495.7	3.4	40.6
			Ab 29.8 ± 3.8	541.2	17.9	101.3
			An 1.4 ± 1.0	706.3	1.5	80.9
Ward's- Oligoclase	Mattawa, Ontario, Canada	Unknown	Oligoclase ^{1, 2, 3}	445.7	4.2	71.4
			Or 4.2 ± 1.5	499.7	2.6	37.1
			Ab 73.1 ± 4.6	564.7	1.9	58.0
			An 22.7 ± 4.3	716.8	7.7	85.8
Ward's- Albite	Amelia County, Virginia	Unknown	Albite ^{1, 2, 3}	440.6	2.1	71.1
			Or 2.0 ± 1.5	490.2	1.4	28.9
			Ab 93.1 ± 11.8	553.4	1.1	61.5
			An 4.9 ± 10.8	704.3	5.0	102.3
Ward's- Microcline	Richardson Quarry, Verona, Ontario, Canada	Unknown	Alkali ^{1, 2, 3}	437.7	2.1	55.1
			Or 62.6 ± 9.9	500.1	1.4	52.7
			Ab 36.4 ± 9.1	572.3	6.5	75.4
			An 1.0 ± 1.2	702.4	5.1	79.7
Ward's- Andesine	Hanover County, Virginia	Unknown	Andesine ^{1, 2, 3}	434.5	2.9	60.7
			Or 19.4 ± 6.2	489.7	0.8	29.4
			Ab 47.1 ± 5.5	555.3	1.8	100.2
			An 33.6 ± 3.2	700.6	6.6	110.1
Ward's- Labradorite	Sonora, Mexico	Unknown	Labradorite ^{1, 2, 3}	447.4	1.5	69.8
			Or 2.4 ± 0.9	493.7	0.3	37.7
			Ab 35.3 ± 2.2	554.7	0.7	70.6
			An 62.3 ± 2.3	697.5	2.2	101.2

Ward's- Bytownite	Beaver Bay, Minnesota	Unknown	Bytownite ^{1, 2, 3}	441.3	1.4	55.2
			Or 1.1 ± 0.6	494.4	2.1	55.4
			Ab 26.1 ± 6.3	555.1	1.1	67.7
			An 72.8 ± 6.4	682.3	2.2	112.5

Techniques: ¹PIXE; ²μXRF; ³EMP; ⁴LA-ICP-MS