

# MinIdent-Win - spodumene

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**Formula:** LiAlSi<sub>2</sub>O<sub>6</sub>

**Status:** Mineral name is IMA approved or traditional

**Level:** Species

**Parents:** clinopyroxenes

**Symmetry:** Monoclinic

**Mean Atomic Number:** 10.5

**Diffraction Values:** 2.920, 2.790, 4.210, 6.120, 4.360

**Kretz abbreviation:** Spd

**First Described** in 1800

**Space Group:** C2/c




**Z number:** 4

**ICDD (TM) Number:** 33-786

	Minimum	Maximum	Average	Std. Dev.
a (A)	9.450	9.520	9.520	
b (A)	8.300	8.390	8.320	
c (A)	5.215	5.250	5.250	
Alpha	90.000	90.000	90.000	
Beta	110.000	110.470	110.333	
Gamma	90.000	90.000	90.000	
Volume	384.370	392.854	389.922	

	Minimum	Maximum	Average	Std. Dev.
n(Alpha)	1.648	1.670	1.659	
n(Beta)	1.655	1.671	1.666	
n(Gamma)	1.662	1.682	1.677	
Max. birefrin	0.012	0.025	0.018	
2V Gamma	54	69	64	

**Optical Sign:** +ve **OAP Orientation:** Parallel (010)

C(Alpha)		Pale Lilac, Colourless
C(Beta)		Pale Lilac, Colourless
C(Gamma)		Colourless
Dispersion	V>R	

	Minimum	Maximum	Average	Std. Dev.
Mohs	6.5	7.5	7.0	
Vickers	943	1343	1133	
Density	3.00	3.22	3.15	0.03

	Total Min Wt (%)	Anal. Min Wt (%)	Average Wt (%)	Anal. Max Wt (%)	Total Max Wt (%)	Average Atomic	Coordination
H	0.0000	0.0000	0.0303	0.0862	0.0862	0.0561	
Li	2.6941	2.6941	3.2871	3.6556	3.7665	0.8861	6
Be	0.0000	0.0000	0.0004	0.0050	0.0050	0.0001	
B	0.0000	0.0000	0.0004	0.0050	0.0050	0.0001	
O	50.8400	50.8400	51.3120	51.6605	52.1010	6.0000	
Na	0.0000	0.0074	0.3772	1.2463	1.2463	0.0307	6
Mg	0.0000	0.0000	0.0377	0.2352	0.2352	0.0029	6
Al	13.7605	13.7605	14.4282	15.0413	15.0413	1.0005	6
Si	29.2664	29.2664	29.8572	30.4303	30.4900	1.9886	4
P	0.0000	0.0000	0.0034	0.0218	0.0218	0.0002	4
K	0.0000	0.0000	0.0995	0.5728	0.5728	0.0048	
Ca	0.0000	0.0000	0.0462	0.3216	0.3216	0.0022	
Ti	0.0000	0.0000	0.0067	0.0540	0.0540	0.0003	
V	0.0000	0.0272	0.0408	0.0544	0.0544	0.0015	
Cr	0.0000	0.0000	0.0179	0.1200	0.1200	0.0006	6
Mn	0.0000	0.0000	0.0483	0.2478	0.2478	0.0016	6
Fe	0.0000	0.0140	0.4931	1.1051	1.1051	0.0165	6
Cu	0.0000	0.0000	0.0011	0.0150	0.0150	0.0000	

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<b>Rb</b>	0.0000	0.0000	0.0001	0.0018	0.0018	0.0000
<b>Cs</b>	0.0000	0.0000	0.0001	0.0009	0.0009	0.0000
<b>Total</b>			100.0877			9.9929

Atomic proportions calculated for O = 6.0

Compilation based on 6 general and 17 sample records

*Values in italics are calculated from the minimum and maximum values. Other data are from the sample and general records.*

**Other lumin.**  Cathodoluminescent: Pink, Orange

Comp. Plan.	Comp. Surf.	Twin Plane	Twin Axis	Notes
{010}			[001]	Penetration, Contact
{021}		{021}		Contact
{0-21}		{0-21}		Contact
{001}		{001}		Contact
{010}		{010}		Polysynthetic
			[010]	Parallel, Polysynthetic
			[100]	Parallel, Polysynthetic

**Notes on hand specimen data:** Commonly exhibits "labradorescence, a play of colours due to submicroscopic, film-like exsolution.

**Synonyms:** hiddenite, kunzite, triphane

**Remarks:** White, pale grey, yellow, green or lavender in colour. Transparent to translucent with a pearly to vitreous lustre. Spodumene is brittle with a splintery fracture and the typical, excellent, prismatic pyroxene cleavages at 93/87 degrees. Crystals are prismatic and sometimes enormous, weighing several tons. The mineral may also be massive. Spodumene is an important ore of Li. The gemmy varieties include "hiddenite" (apple green) and "kunzite" (lilac).

**Occurrences:** In granitic Li-pegmatites, associated with minerals such as beryl, tourmaline, lepidolite, amblygonite, apatite, etc.

**Localities of samples used in compilation:** Bernic Lake, Manitoba, Canada. Etta mine, Black Hills and Keystone, South Dakota; Pala, San Diego, California; Rist Emerald mine, Hiddenite, North Carolina, U.S.A. Mt. Marion, Western Australia, Australia. Ooregum mine, Kolar gold field, India. Varuträsk and Kluntarna Island, Sweden. Haapaluoma, Finland. St. Radegund, Graz, Austria. Katumba, Congo. China (locality unspecified).

**References:** Min. Mag. v.49, p.758-759. Can. Min. v.44, p.1529-1541. Deer et al. (1963) v.2, p.92-98; (1978) v.2A, p.527-544. Roberts et al. (1974) Encycl. Mins. Dana (6th) p.366.

# MinIdent-Win

Spodumene (var. kunzite)



Spodumene (var. kunzite).  
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**Caption:** This is a precious kunzite variety of spodumene, highly prized as a collector's gem. The specimen is a parallel growth of several individual crystals which show well developed {110} prism faces and are terminated by {111} faces. The specimen shows the heavy striations parallel to [001] that are very common in this mineral. For scale, the ten cent coin at lower right is 1.8 cm in diameter. Locality: Mawa, Nouristan, Afghanistan.

**Keywords:** spodumene; kunzite; triphane; pyroxenes; clinopyroxenes; semi-precious stone; gemstone; collector's gem; parallel growth; striations; Mawa; Nouristan; Afghanistan.; lithium ore

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