

# Darapskite

# $\text{Na}_3(\text{NO}_3)(\text{SO}_4) \cdot \text{H}_2\text{O}$

© 2001-2005 Mineral Data Publishing, version 1

**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . As tabular to prismatic crystals, elongated on [001] or [010], flattened on {100}, to 10 cm; less commonly as thick tabular {100} crystals with square to slightly rectangular outlines; rarely stalactitic, as flowstone, or in “flowers”; commonly in granular aggregates mixed with other saline minerals. *Twinning:* With composition plane {100}; may be polysynthetic.

**Physical Properties:** *Cleavage:* On {010} and {100}, perfect. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 2.201(5) D(calc.) = 2.202 Soluble in  $\text{H}_2\text{O}$ .

**Optical Properties:** Transparent to translucent. *Color:* Colorless. *Luster:* Vitreous. *Optical Class:* Biaxial (-). *Orientation:*  $X = b$ ;  $Z \wedge c = 12^\circ\text{--}13^\circ$ . *Dispersion:*  $r > v$ , strong.  $\alpha = 1.388\text{--}1.391$   $\beta = 1.479\text{--}1.481$   $\gamma = 1.486$   $2V(\text{meas.}) = 27(1)^\circ$   $2V(\text{calc.}) = 26^\circ\text{--}33^\circ 35'$

**Cell Data:** *Space Group:*  $P2_1/m$ .  $a = 10.564(2)$   $b = 6.913(1)$   $c = 5.1890(9)$   
 $\beta = 102^\circ 47.8(0.8)'$   $Z = 2$

**X-ray Powder Pattern:** Oficina Alemania, Chile.  
10.29 (100), 3.456 (35), 2.865 (35), 2.594 (30), 4.13 (25), 3.522 (25), 3.266 (18)

Chemistry:	(1)	(2)
$\text{SO}_3$	32.88	32.67
$\text{N}_2\text{O}_5$	22.26	22.04
$\text{Na}_2\text{O}$	38.27	37.94
$\text{H}_2\text{O}$	7.30	7.35
Total	100.71	100.00

(1) Oficina Lautaro, Chile. (2)  $\text{Na}_3(\text{NO}_3)(\text{SO}_4) \cdot \text{H}_2\text{O}$ .

**Occurrence:** Widespread in commercial nitrate deposits, filling veins and cavities in cemented regolith, in an arid region (Chile); in saline arid soil (Death Valley, California, USA; Antarctica); a component of “flowers” and other cave incrustations, the nitrate probably supplied from urine and guano.

**Association:** Nitratine, niter, blödite, mirabilite, epsomite, halite, anhydrite.

**Distribution:** In Chile, in Antofagasta, from Oficina Lautaro, Pampa del Toro, Taltal district, in thick veins from Chuquicamata, and widespread in other nitrate deposits, such as those around Oficinas Alemania, María Elena, Victoria, Santa Lucia, and others; at Zapiga, Tarapacá. In Antarctica, around Mt. Erebus and in the Wright Valley, Victoria Land; in the McMurdo region. In the USA, from the Mineral Mountain mine, south of Stein’s Pass, Peloncillo Mountains, Greenlee Co., Arizona; in California, in Death Valley, Inyo Co., as deposits in soil and in caves in the Funeral Mountains; in Flower Cave, southern Big Bend National Park, Texas.

**Name:** Honors Ludwig Darapsky (1857–1916), German–Chilean chemist and mineralogist, Santiago, Chile.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana’s system of mineralogy, (7th edition), v. II, 309–311. (2) Ericksen, G.E. and M.E. Mrose (1970) Mineralogical studies of the nitrate deposits of Chile. II. Darapskite,  $\text{Na}_3(\text{NO}_3)(\text{SO}_4) \cdot \text{H}_2\text{O}$ . Amer. Mineral., 55, 1500–1517. (3) Hill, C.A. and R.C. Ewing (1977) Darapskite,  $\text{Na}_3(\text{NO}_3)(\text{SO}_4) \cdot \text{H}_2\text{O}$ , a new occurrence, in Texas. Mineral. Mag., 41, 548–550. (4) Sabelli, C. (1967) La struttura della darapskite. Atti Rend. Accad. Lincei, 42, 874–887 (in Italian with English abs.).