Hidalgoite $PbAl_3(AsO_4)(SO_4)(OH)_6$

Crystal Data: Hexagonal. *Point Group:* $3m$. Commonly as compact porcelaneous to porous masses; in tiny spherulitic aggregates.

Physical Properties: *Fracture:* Irregular to conchoidal. *Tenacity:* Brittle. Hardness = 4.5 D(meas.) = 3.71–3.96 D(calc.) = 4.15–4.27

Optical Properties: Translucent. *Color:* White, pale green, pistachio-green, emerald-green. *Streak:* White. *Luster:* Dull in aggregates.
Optical Class: Uniaxial (+). *Dispersion:* Strong. $\omega = 1.713–1.730$ $\epsilon = 1.715–1.735$

Cell Data: *Space Group: R3m.* a = 7.04(2) $c = 16.99(2)$ Z = 3

X-ray Powder Pattern: San Pascual mine, Mexico.
2.981 (10), 5.73 (9), 3.51 (9), 1.911 (8), 2.257 (7), 1.761 (6), 1.496 (6)

Chemistry:

	(1)	(2)	(3)
SO_3	15.03	4.2	12.81
As_2O_5	16.27	20.3	18.38
Sb_2O_5	0.20		
SiO_2	0.32		
Al_2O_3	24.25	23.0	24.46
Fe_2O_3	0.57	1.5	
CuO		0.4	
ZnO	0.88	0.4	
PbO	32.84	36.2	35.70
H_2O	9.70	13.8	8.65
Total	100.06	99.8	100.00

(1) San Pascual mine, Mexico; H_2O by a modified Penfield method. (2) Gold Hill mine, Utah, USA; H_2O by loss on ignition. (3) $PbAl_3(AsO_4)(SO_4)(OH)_6$.

Mineral Group: Beudantite group.

Occurrence: A rare secondary mineral of the oxide zone of polymetallic sulfide deposits.

Association: Beudantite, tourmaline, "limonite" (San Pascual mine, Mexico); mansfieldite, carbonate-cyanotrichite (Cap Garonne mine, France).

Distribution: From the San Pascual mine, nine km northwest of Zimapán, Hidalgo, Mexico. In the USA, from the Gold Hill mine, Tooele Co., Utah; in the Mohawk mine, Clark Mountains, San Bernardino Co., California; and from Tombstone, Cochise Co., and in the Silver Crown mine, Yavapai Co., Arizona. At the Cap Garonne mine, near le Pradet, Var, France. In the Falotta mine, Oberhalbstein, Graubünden, Switzerland. At Ramsbeck, North Rhein-Westphalia, Germany. From the Penberthy Croft mine, St. Hilary, Cornwall, England. In Australia, from the Adelaide mine, Dundas, Tasmania, and at Broken Hill, New South Wales. From Tsumeb, Namibia.

Name: For Hidalgo, the state in Mexico that produced the first specimens.

Type Material: National School of Mines, Paris, France; Harvard University, Cambridge, Massachusetts, 106373–106375; National Museum of Natural History, Washington, D.C., USA, 112726, 112727.

References: (1) Smith, R.L., F.S. Simons, and A.C. Vlisidis (1953) Hidalgoite, a new mineral. Amer. Mineral., 38, 1218–1224. (2) Guillemin, C., (1955) Sur une variété d'hidalgoïte du Cap Garonne (Var). Bull. Minéral., 78, 27–32 (in French). (3) Clarkson, J.F., W.L. Roberts, and A.L. Lingard (1971) Hidalgoite from Gold Hill, Utah. Mineral. Record, 2, 212–213.