

**Crystal Data:** Orthorhombic. *Point Group:* 2/m 2/m 2/m. As subhedral, commonly oriented inclusions in galena to 200 μm.

**Physical Properties:** *Cleavage:* None observed. *Tenacity:* Brittle. *Fracture:* Uneven. VHN = 245- 263, 253 average (10 g load). Hardness = 3.5 D(meas.) = n.d. D(calc.) = 6.89

**Optical Properties:** Opaque. *Color:* Gray with a brownish tint, lacks internal reflections.

*Streak:* Dark gray. *Luster:* Metallic.

*Optical Class:* Birefractance: Strong. *Pleochroism:* Strong, light gray with a brownish tint to light cream with a greenish tint. *Anisotropism:* Strong, in shades of pale grey, deep green, and deep blue. R<sub>1</sub>-R<sub>2</sub>: (470) 40.2-45.7 (23.8-26.4)<sub>oil</sub>, (546) 39.3-44.5 (23.2-25.9)<sub>oil</sub>, (589) 38.9-44.1 (23.1-25.7)<sub>oil</sub>, (650) 38.6-44.1 (23.0-25.8)<sub>oil</sub>

**Cell Data:** *Space Group:* Pnma. *a* = 12.734(5) *b* = 4.032(1) *c* = 14.633(5) *Z* = 4

**X-ray Powder Pattern:** Ángela mine, Los Manantiales mining district, Chubut Province, Argentina. 3.66 (100), 3.02 (100), 2.646 (60), 3.11 (50), 2.011 (40), 3.31 (30), 3.50 (20)

Chemistry:	(1)	(2)
Cu	16.7(3)	16.31
Ag	13.4(2)	13.84
Pb	27.8(6)	26.58
Bi	26.6(5)	26.81
S	16.0(2)	16.45
Total	100.5(5)	100.00

(1) Ángela mine, Los Manantiales mining district, Chubut Province, Argentina; by electron microprobe analysis; corresponding to Cu<sub>2.07</sub>Ag<sub>0.97</sub>Pb<sub>1.05</sub>Bi<sub>1.00</sub>S<sub>3.91</sub>. (2) Cu<sub>2</sub>AgPbBiS<sub>4</sub>.

**Occurrence** A hypogene mineral in polymetallic Au- and Ag-bearing veins. Probably part of an exsolution assemblage from originally copper-silver-bismuth-rich galena.

**Association:** Pyrite, sphalerite, chalcopyrite, hematite, native gold, galena, aikinite, wittichenite, miharaite, cervelleite.

**Distribution:** At the Ángela veins, Los Manantiales mining district, Chubut Province, Argentina.

**Name:** For the group of mineralized veins from which the first specimens were collected.

**Type Material:** Systematic Mineralogical Collection, Department of Materials Research and Physics, Division of Applied Mineralogy, University of Salzburg, Austria (14934).

**References:** (1) Topa, D., W.H. Paar, H. Putz, G. Zagler, M.K. de Brodtkorb, C.J. Stanley, A.C. Roberts, and E. Makovicky (2010) Mineralogical data on angelaites, Cu<sub>2</sub>AgPbBiS<sub>4</sub>, from the Los Manantiales District, Chubut, Argentina. *Can. Mineral.*, 48(1), 139-144. (2) Brodtkorb, M.K. de and W.H. Paar (2004) Ángelaíta, en la paragénesis del distrito Los Manantiales, provincia de Chubut: una nueva especie mineral. *Rev. Asoc. Geol. Argentina*, 59, 787-789. (3) Topa, D., E. Makovicky, and H. Putz (2010) The crystal structure of angelaites, Cu<sub>2</sub>AgPbBiS<sub>4</sub>. *Can. Mineral.*, 48(1), 145-153. (4) Williams, P.A., F. Hatert, M. Pasero, and S.J. Mills (2010) IMA Commission on New Minerals, Nomenclature and Classification (CNMNC) Newsletter 6, New minerals and nomenclature modifications approved in 2010. *Mineral. Mag.*, 74(6), 942.