

**Zdenekite****NaPbCu<sub>5</sub>(AsO<sub>4</sub>)<sub>4</sub>Cl·5H<sub>2</sub>O**

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**Crystal Data:** Tetragonal. *Point Group:* 422. Tabular crystals, to 0.1 mm, flattened on {001}, showing {001}, {100}, {110}, in spherical aggregates and crusts.

**Physical Properties:** *Cleavage:* On {001}, perfect. *Fracture:* Irregular. *Tenacity:* Fragile [sic]. Hardness = Soft. D(meas.) = 4.1(1) D(calc.) = [4.08]

**Optical Properties:** Translucent. *Color:* Turquoise-blue. *Streak:* Pale blue.

*Luster:* Vitreous.

*Optical Class:* Uniaxial (-). *Pleochroism:* Strong; O = turquoise-blue; E = pale blue to light green.  $\omega = 1.770(5)$   $\epsilon = 1.710(5)$

**Cell Data:** *Space Group:*  $P4_122$  or  $P4_322$ .  $a = 10.066(1)$   $c = 39.39(4)$   $Z = 8$

**X-ray Powder Pattern:** Cap Garonne mine, France.

9.83 (100), 3.132 (90), 4.925 (60), 4.482 (50b), 2.515 (50), 2.772 (40), 1.778 (40)

**Chemistry:**

	(1)	(2)
As <sub>2</sub> O <sub>5</sub>	36.66	37.40
CuO	32.97	32.36
PbO	16.79	18.16
CaO	0.62	
Na <sub>2</sub> O	2.92	2.52
Cl	3.54	2.88
H <sub>2</sub> O	7.2	7.33
-O = Cl <sub>2</sub>	0.80	0.65
Total	99.90	100.00

(1) Cap Garonne mine, France; by electron microprobe, average of 16 analyses, H<sub>2</sub>O by TGA; corresponding to Na<sub>1.15</sub>Ca<sub>0.13</sub>Pb<sub>0.92</sub>Cu<sub>5.09</sub>(AsO<sub>4</sub>)<sub>3.90</sub>Cl<sub>1.23</sub>·4.91H<sub>2</sub>O.

(2) NaPbCu<sub>5</sub>(AsO<sub>4</sub>)<sub>4</sub>Cl·5H<sub>2</sub>O.

**Occurrence:** A rare post-mining mineral formed in the oxidized zone of a red-bed sandstone Pb-Cu deposit (Cap Garonne mine, France).

**Association:** Olivenite, geminite, antlerite, anglesite, covellite, tennantite, galena (Cap Garonne mine, France); mimetite, beudantite-segnite (Broken Hill, Australia).

**Distribution:** From the Cap Garonne mine, near le Pradet, Var, France. At Broken Hill, New South Wales, Australia.

**Name:** Honoring Dr. Zdenek Johan (1935–), mineralogist and Director of Scientific Affairs, Bureau de Recherches Géologiques et Minières, Orléans, France.

**Type Material:** Natural History Museum, Geneva, Switzerland; Natural History Museum, Paris, France.

**References:** (1) Chiappero, P.-J. and H. Sarp (1995) Zdenekite, NaPbCu<sub>5</sub>(AsO<sub>4</sub>)<sub>4</sub>Cl·5H<sub>2</sub>O, a new mineral from the Cap Garonne mine, Var, France. *Eur. J. Mineral.* 7, 553–557. (2) (1996) *Amer. Mineral.*, 81, 253 (abs. ref. 1).