Mahnertite $(Na,Ca)Cu_3(AsO_4)_2Cl•5H_2O$

Crystal Data: Tetragonal. *Point Group:* 4/*m* 2/*m* 2/*m*. Crystals, square in outline, to 0.1 mm, flattened on [001], showing {001}, {100}; in subparallel groups giving spherical aggregates.

Physical Properties: *Cleavage:* Perfect on {001}. *Fracture:* Irregular. *Tenacity:* Fragile [*sic*]. Hardness = 2-3 D(meas.) = 3.33(2) D(calc.) = 3.14

Optical Properties: Translucent. *Color:* Bright blue to emerald-green. *Streak:* Pale blue. *Luster:* Vitreous.
Optical Class: Uniaxial (–). ω = 1.686(2) ε = 1.635(2) *Pleochroism:* Strong; *O* = blue to intense blue-green; *E* = blue to green.

Cell Data: *Space Group: I*4/*mmm*. a = 10.037(1) c = 23.739(1) Z = 8

X-ray Powder Pattern: Cap Garonne mine, France.
11.90 (100), 3.098 (80), 3.061 (70), 9.29 (60), 5.043 (60), 7.131 (50), 4.641 (40)

Chemistry:

	(1)
As_2O_5	39.07
CuO	36.37
CaO	2.14
Na_2O	4.58
K_2O	0.40
Cl	4.67
H_2O	14.5
$-O = Cl_2$	1.05
Total	100.68

(1) Cap Garonne mine, France; by electron microprobe; H_2O by loss on heating; corresponds to $(Na_{0.90}Ca_{0.23}K_{0.05})_{\Sigma=1.18}Cu_{2.79}(AsO_4)_{2.07}Cl_{0.81}•4.91H_2O$.

Occurrence: In the oxidized zone of an arsenic-rich copper deposit (Cap Garonne mine, France).

Association: Tennantite, covellite, geminite, pushcharovskite, quartz (Cap Garonne mine, France).

Distribution: From the Cap Garonne mine, near le Pradet, Var, and at the Salsigne mine, 15 km north of Carcassone, Aude, France. In the Falotta mine, Oberhalbstein, Graubünden, Switzerland.

Name: To honor Dr. Volker Mahnert (b. 1943), Director, Natural History Museum, Geneva, Switzerland.

Type Material: Natural History Museum, Geneva, Switzerland.

References: (1) Sarp, H. (1996) La mahnertite, $(Na,Ca)Cu_3(AsO_4)_2Cl•5H_2O$, un nouveau minéral de la mine de Cap Garonne, Var, France. Archs Sci. Genéve, 49(2), 119-126 (in French with English abs.). (2) (1997) Amer. Mineral., 82, 1262 (abs. ref. 1). (3) Pushcharovsky, D.Y., N. Zubkova, S.J. Teat, E.J. Maclean, and H. Sarp (2004) Crystal structure of mahnertite, Eur. J. Mineral. 16, 687-692. (4) (2005) Amer. Mineral., 90, 772 (abs. ref. 3).