

**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . As globular to coalesced pellet-like aggregates, to 1.5 mm, comprised of fibrous crystals, to 75  $\mu\text{m}$ .

**Physical Properties:** *Cleavage:* None observed. *Tenacity:* Brittle. Hardness = 3.5-4  
D(meas.) = 3.22(2) D(calc.) = 3.33 Readily soluble in 1:1 HCl.

**Optical Properties:** Translucent. *Color:* Straw-yellow (exterior) to dark brown (core).  
*Streak:* White to light brown. *Luster:* Vitreous (crystals); silky (tufts).  
*Optical Class:* Biaxial (+).  $\alpha = 1.741$   $\beta = 1.762$   $\gamma = 1.797$   $2V(\text{calc.}) = 77^\circ$  *Orientation:*  $Z = \sim c$ .  
*Pleochroism:* Distinct,  $X =$  colorless,  $Z =$  medium yellow. *Absorption:*  $Z > X, Y$ . Parallel extinction and length slow.

**Cell Data:** *Space Group:*  $P2_1/c$ .  $a = 10.2635(9)$   $b = 9.7028(8)$   $c = 5.5711(5)$   $\beta = 94.207(1)^\circ$   $Z = 2$

**X-ray Powder Pattern:** Dolores showing, near Pastrana, Province of Murcia, southeastern Spain. 7.04 (100), 10.2 (95), 4.81 (65), 4.24 (60), 2.87 (55), 2.89 (25), 4.51 (20)

<b>Chemistry:</b>	(1)
MgO	0.89
MnO	1.14
CoO	7.06
CuO	0.20
Fe <sub>2</sub> O <sub>3</sub>	31.88
As <sub>2</sub> O <sub>5</sub>	42.57
P <sub>2</sub> O <sub>5</sub>	0.56
SO <sub>3</sub>	0.07
H <sub>2</sub> O	[16.64]
Total	101.01

(1) Dolores showing, near Pastrana, Province of Murcia, southeastern Spain; by electron microprobe, average of 10 analyses, H<sub>2</sub>O calculated; corresponding to  
(Co<sub>0.50</sub>Mg<sub>0.12</sub>Fe<sup>3+</sup><sub>0.11</sub>Mn<sub>0.08</sub>Cu<sub>0.01</sub>□<sub>0.11</sub>)<sub>Σ=0.93</sub>Fe<sup>3+</sup><sub>2</sub>[(AsO<sub>4</sub>)<sub>1.95</sub>(PO<sub>4</sub>)<sub>0.04</sub>(SO<sub>4</sub>)<sub>0.01</sub>]<sub>Σ=2.00</sub>(OH)<sub>1.74</sub>•4H<sub>2</sub>O.

**Mineral Group:** Arthurite group.

**Occurrence:** Product of oxidation in a near-surface, sulfide-depleted lens.

**Association:** Pharmacosiderite, conicalcite, olivenite, jarosite, arseniosiderite, scorodite, malachite, azurite, chlorargyrite, mixite, lavendulan.

**Distribution:** From the Dolores showing, near Pastrana, ~10 km east of Mazarrón, Province of Murcia, southeastern Spain. At Khder, Bou Azzer district, Morocco.

**Name:** For a member of the *arthurite* group with essential *cobalt* in the composition.

**Type Material:** Canadian Museum of Nature, Ottawa, Ontario (NMNMC 83399).

**References:** (1) Jambor, J.L., J. Viñals, L.A. Groat, and M. Raudsepp (2002) Cobaltarthurite,  $\text{Co}^{2+}\text{Fe}^{3+}_2(\text{AsO}_4)_2(\text{OH})_2 \cdot 4\text{H}_2\text{O}$ , a new member of the arthurite group. *Can. Mineral.*, 40, 725-732. (2) Raudsepp, M. and E. Pani (2002) The crystal structure of cobaltarthurite,  $\text{Co}^{2+}\text{Fe}^{3+}_2(\text{AsO}_4)_2(\text{OH})_2 \cdot 4\text{H}_2\text{O}$ : a Rietveld refinement. *Can. Mineral.*, 40, 733-737. (3) (2003) *Amer. Mineral.*, 88, 475-476 (abs. refs. 1 and 2). (4) Kampf, A.R. (2005) The crystal structure of cobaltarthurite from the Bou Azzer district, Morocco: the location of hydrogen atoms in the arthurite structure-type. *Can. Mineral.*, 43, 1387-1391. (5) (2006) *Amer. Mineral.*, 91(4), 715 (abs. ref. 4 and comment).