## Uzonite $As_4S_5$



**Crystal Data:** Monoclinic. *Point Group:* $2/m$. As prismatic crystals, to 0.5 mm, elongated along [001], with {110}, {001}, {101}; {110} exhibits fine striations ∥ [$1\bar{1}1$]. *Twinning:* Cruciform twins with twin axis [100] and a growth plane near {011}.

**Physical Properties:** *Cleavage:* {001}. Hardness = ∼1.5 VHN = 66–71 (8 g load). D(meas.) = 3.385 D(calc.) = 3.37

**Optical Properties:** Transparent. *Color:* Yellow; in reflected light, grayish white with bright yellow internal reflections. *Luster:* Pearly to slightly greasy on a broken surface.
*Optical Class:* Biaxial (+). $\alpha = 2.38(1)$ ($\alpha'$) $\gamma = 2.68(1)$ ($\gamma'$)
$R_1$–$R_2$: (400) 18.8–20.1, (425) 18.8–20.0, (450) 18.7–19.9, (475) 18.3–19.7, (500) 18.1–19.2, (525) 19.0–19.8, (550) 19.4–20.0, (575) 19.4–19.9, (600) 19.3–19.7, (625) 19.2–19.4, (650) 19.1–19.3, (675) 19.0–19.2, (700) 18.8–19.0

**Cell Data:** *Space Group:* $P2_1/m$. $a = 7.98(1)$ $b = 8.10(1)$ $c = 7.09(1)$ $\beta = 100.14(3)°$
$Z = 2$

**X-ray Powder Pattern:** Uzon caldera, Russia.
5.81 (100), 3.602 (80), 2.905 (80), 5.31 (60), 3.100 (60), 2.820 (60)

**Chemistry:**

| | (1) | (2) |
|---|---|---|
| As | 64.65 | 65.15 |
| S | 34.09 | 34.85 |
| Total | 98.74 | 100.00 |

(1) Uzon caldera, Russia; by electron microprobe, average of three grains; corresponds to $As_{4.03}S_{4.97}$. (2) $As_4S_5$.

**Occurrence:** As intergrowths with realgar in the pore spaces of tuffaceous sediments 10–30 cm deep in a caldera.

**Association:** Realgar, cubic $\alpha$–arsenic sulfide, amorphous arsenic sulfide, orpiment, alacranite, stibnite, cinnabar, pyrite, sulfur.

**Distribution:** From the Uzon caldera, Kamchatka, Russia [TL].

**Name:** For the type locality, Uzon caldera, Russia.

**Type Material:** Il'menskii Preserve Museum, Miass, 3911; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 87574.

**References:** (1) Popova, V.I. and V.O. Polyakov (1985) Uzonite $As_4S_5$ – a new sulphide of arsenic from Kamchatka. Zap. Vses. Mineral. Obshch., 114, 369–373 (in Russian). (2) (1986) Amer. Mineral., 71, 1280 (abs. ref. 1). (3) Migdisov, A.A. and A.Y. Bychkov (1998) The behavior of metals and sulphur during the formation of hydrothermal mercury–antimony–arsenic mineralization, Uzon caldera, Kamchatka, Russia. J. Volcan. and Geothermal Res., 84, 153–171. (4) Whitfield, ?? (1973) ??title?? J. Chem. Soc., Dalton Trans., ?? 1740–1742. [??str MFG]