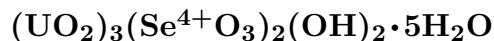


Haynesite



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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$ or $mm2$. Crystals are bladed, flattened on {010} and elongated along [001], to 3 mm; as divergent sprays and rosettes.

Physical Properties: *Cleavage:* On {010}, good. Hardness = 1.5–2 D(meas.) = 4.1 D(calc.) = 4.07 Radioactive; fluoresces yellowish green under SW UV.

Optical Properties: Transparent to translucent. *Color:* Amber-yellow; yellow in transmitted light. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Pleochroism:* Strong; bright yellow to pale yellow. *Orientation:* $X = a; Y = b; Z = c.$ $\alpha = 1.618(2)$ $\beta = 1.738(3)$ $\gamma = 1.765(5)$ $2V(\text{meas.}) = 45^\circ$ $2V(\text{calc.}) = 48^\circ$

Cell Data: *Space Group:* $Pn\bar{c}m$ or $Pnc2$. $a = 8.025(5)$ $b = 17.43(1)$ $c = 6.935(3)$ $Z = 2$

X-ray Powder Pattern: Repete mine, Utah, USA.

8.01 (100), 2.912 (80), 4.01 (70), 3.119 (70), 3.468 (60), 3.186 (50), 2.471 (40)

Chemistry:

	(1)	(2)
UO ₃	71.81	72.22
SeO ₂	17.91	18.68
H ₂ O	8.56	9.10
Total	[98.28]	100.00

(1) Repete mine, Utah, USA; by electron microprobe, average of 12 analyses, C and H by CHN analyzer, recalculated after removal of CaO 0.85% and CO₂ 1.51% as calcite; then corresponds to (UO₂)_{3.08}(SeO₂)_{1.98}(OH)_{2.20}•4.72H₂O. (2) (UO₂)₃(SeO₃)₂(OH)₂•5H₂O.

Occurrence: Rare in an oxidized uranium deposit in mudstones and sandstones.

Association: Andersonite, boltwoodite, ferroselite, gypsum, barite, calcite.

Distribution: From the Repete mine, 34 km southeast of Blanding, San Juan Co., Utah, USA.

Name: Honors Patrick Eugene Haynes (1953-), American geologist, mineral collector and dealer, who found the first specimens.

Type Material: Royal Belgian Institute of Natural Sciences, Brussels, Belgium, RC3922.

References: (1) Deliens, M. and P. Piret (1991) La haynesite, sélénite hydraté d'uranyle, nouvelle espèce minérale de la Mine Repete, comté de San Juan, Utah. *Can. Mineral.*, 29, 561–564 (in French with English abs.). (2) (1992) *Amer. Mineral.*, 77, 447 (abs. ref. 1).