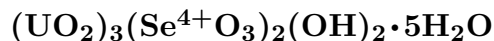


# Haynesite



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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 <sub>3</sub>	71.81	72.22
SeO <sub>2</sub>	17.91	18.68
H <sub>2</sub> 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 CO<sub>2</sub> 1.51% as calcite; then corresponds to (UO<sub>2</sub>)<sub>3.08</sub>(SeO<sub>2</sub>)<sub>1.98</sub>(OH)<sub>2.20</sub>•4.72H<sub>2</sub>O. (2) (UO<sub>2</sub>)<sub>3</sub>(SeO<sub>3</sub>)<sub>2</sub>(OH)<sub>2</sub>•5H<sub>2</sub>O.

**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).