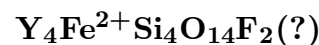


Rowlandite-(Y)



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Crystal Data: Triclinic; commonly metamict. *Point Group:* 1 or $\bar{1}$. As small irregular masses.

Physical Properties: Hardness = 5.5–6.5 D(meas.) = 4.39 when metamict; 4.55 when heated at 900 °C for one hour; 4.85 when crystalline. D(calc.) = [4.33]

Optical Properties: Transparent in thin fragments. *Color:* Pale dull green, grayish white; alters to brick-red material. *Luster:* Vitreous; waxy when altered.

Optical Class: Biaxial (+); isotropic when metamict. $n = 1.704$, metamict; 1.76 when heated at 900 °C for one hour. $\alpha = 1.763$ $\beta = \text{n.d.}$ $\gamma = 1.769$ $2V(\text{meas.}) = \text{n.d.}$

Cell Data: *Space Group:* $P1$ or $P\bar{1}$. $a = 6.59$ $b = 8.65$ $c = 5.53$ $\alpha = 99^\circ 2'$
 $\beta = 104^\circ 8'$ $\gamma = 91^\circ 28'$ $Z = 1$

X-ray Powder Pattern: Baringer Hill, Texas, USA; pattern from metamict material heated one hour in nitrogen at 900 °C; matches crystalline material.

3.06 (100), 4.87 (60), 3.51 (55), 3.59 (50), 2.076 (45), 1.720 (40), 2.608 (35)

Chemistry:

	(1)	(2)
SiO ₂	25.98	30.59
UO ₂	0.40	
Y ₂ O ₃	61.91	57.47
FeO	4.69	9.14
CaO	0.19	
F		4.84
LOI	2.01	
–O = F ₂		2.04
Total		100.00

(1) Baringer Hill, Texas, USA; partial analysis. (2) Y₄FeSi₄O₁₄F₂.

Occurrence: In some rare-earth-rich pegmatites.

Association: Gadolinite, yttrialite (Baringer Hill, Texas, USA).

Distribution: In the Baringer Hill pegmatite, 26 km west of Burnet, Llano Co., and from Clear Creek, Burnet Co., Texas, USA. In the Evans-Lou quarry, near Wakefield Lake, Quebec, Canada. From an unspecified locality in Kazakhstan.

Name: For Henry Augustus Rowland (1848–1901), American physicist and spectroscopist, of Johns Hopkins University, Baltimore, Maryland, USA, student of the spectra of the rare earth elements, and for its *yttrium* content.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 134649.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 1047.
(2) Frondel, C. (1961) Two yttrium minerals: spencite and rowlandite. *Can. Mineral.*, 6, 576–581.
(3) Shipovalov, Y.V. and A.V. Stepanov (1971) X-ray structural study of rowlandite. *Issled. Oblast. Khim. Fiz. Metod. Anal. Min. Syr'ya*, 189–192 (in Russian). (4) (1976) *Mineral. Abs.*, 27, 67 (abs. ref. 3).