Rowlandite-(Y)  

\[ \text{Y}_4\text{Fe}^{2+}\text{Si}_4\text{O}_{14}\text{F}_2(?) \]

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Crystal Data: Triclinic; commonly metamict.  
Point Group: 1 or \( \overline{1} \). 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 \( P\overline{1} \).  
\( a = 6.59 \)  
\( b = 8.65 \)  
\( c = 5.53 \)  
\( \alpha = 99°2' \)  
\( \beta = 104°8' \)  
\( \gamma = 91°28' \)  
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:  

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
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<tbody>
<tr>
<td>SiO₂</td>
<td>25.98</td>
<td>30.59</td>
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<tr>
<td>UO₂</td>
<td>0.40</td>
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<tr>
<td>Y₂O₃</td>
<td>61.91</td>
<td>57.47</td>
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<tr>
<td>FeO</td>
<td>4.69</td>
<td>9.14</td>
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<td>CaO</td>
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<td>F</td>
<td>4.84</td>
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<td>LOI</td>
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<td>(-O = F_2)</td>
<td>2.04</td>
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<tr>
<td>Total</td>
<td>100.00</td>
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</tbody>
</table>

(1) Baringer Hill, Texas, USA; partial analysis.  
(2) \( \text{Y}_4\text{Fe}^{2+}\text{Si}_4\text{O}_{14}\text{F}_2 \).

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.  