Bassetite

Fe²⁺(UO₂)₂(PO₄)₂•8H₂O

Crystal Data: Monoclinic, pseudotetragonal. Point Group: 2/m. Crystals, with square or rectangular outline, to 3 mm, are thin tablets, flattened on [010], showing {111}, {101}, {110}, {001}, {010}; typically in parallel or fanlike groups. Twinning: Two or more individuals at ~90° with [001] of one individual || [100] of the other; common.

Physical Properties: Cleavage: {010}, perfect; {100} and {001}, distinct. Hardness = 2.5 D(meas.) = 3.40–3.63 D(calc.) = 3.63 Radioactive.

Optical Properties: Transparent; in transmitted light, seen as sectored due to twinning. Color: Olive-green, olive-brown, yellowish brown, bronzey yellow, yellow. Luster: Vitreous, bronzey on {010}. Optical Class: Biaxial (~) (probable). Pleochroism: X = Y = yellow; Z = dark olive-brown to brownish black. Orientation: X = b; Y ∧ c = 18.5°. Dispersion: r > v, strong. α = 1.603(2) β = 1.610(2) γ = 1.617(2) 2V(meas.) = ~90°

Cell Data: Space Group: P2₁/m (synthetic). a = 6.98(4) b = 17.07(4) c = 7.01(7) β = 90°32(5)’ Z = 2

X-ray Powder Pattern: Cornwall, England. 4.89 (10), 3.46 (10), 8.59 (6), 2.20 (6), 4.24 (3), 4.05 (3), 2.96 (3)

Chemistry:

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<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UO₃</td>
<td>61.99</td>
<td>62.71</td>
<td>61.51</td>
<td>H₂O</td>
<td>14.49</td>
<td>14.20</td>
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<tr>
<td>P₂O₅</td>
<td>15.21</td>
<td>15.43</td>
<td>15.26</td>
<td>Insol.</td>
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<tr>
<td>FeO</td>
<td>7.60</td>
<td>7.78</td>
<td>7.73</td>
<td>Total</td>
<td>100.20</td>
<td>100.12</td>
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<tr>
<td>CuO</td>
<td>0.28</td>
<td></td>
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</table>

(1) Wheal Basset, Cornwall, England. (2) Arcu su Linnarbu, Italy. (3) Fe(UO₂)₂(PO₄)₂•8H₂O.

Mineral Group: Meta-autunite group.

Occurrence: A rare secondary mineral in the oxidized zone of some uranium-bearing hydrothermal mineral deposits.

Association: Uranospathite, torbernite, uraninite, pyrite (Basset mines, England); meta-autunite, torbernite (Arcu su Linnarbu, Italy); saléeite, metanovanéckite (Sue mine, Arizona, USA).

Distribution: In England, from the Basset group of mines, Illogan, and the South Terras mine, St. Stephen-in-Brannel, Cornwall. At Arcu su Linnarbu, Capoterra, near Cagliari, Sardinia, Italy. From Daverdisse, Belgium. At the Los Ratones and Pedro Alvaro vanadium mines, Salamanca Province, Spain. From the La Crouzille mine, Haute-Vienne, France. In the USA, on Overland Mountain, Jamestown district, Boulder Co., Colorado; in Utah, from the Denise No. 1 mine and in the Fumrol mine, Temple Mountain, Emery Co., Utah; in Arizona, at the Sue and Red Bluff mines, Sierra Ancha Mountains, and widespread in the Dripping Springs quartzite in the northwestern part of Gila Co.; from the Merry Widow mine, Grant Co., New Mexico.

Name: For the Basset mine group, Cornwall, England, from which it was first described.


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