Retgersite

\[
\text{NiSO}_4 \cdot 6\text{H}_2\text{O}
\]

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Crystal Data: Tetragonal. Point Group: 422. Rare in crude single crystals, to 3 mm; as fibers, elongated along [001], may be twisted spire- and hornlike, and in veinlets; most commonly as efflorescences.

Physical Properties: Cleavage: On {001}, perfect; on {110}, in traces, microscopically observed. Fracture: Subconchoidal to uneven. Tenacity: Brittle. Hardness = 2.5

\[ D(\text{meas.}) = 2.04 \quad D(\text{calc.}) = 2.075 \]

Soluble in H\(_2\)O, taste slightly bitter and metallic.


Optical Class: Uniaxial (−). \( \omega = 1.510–1.511 \quad \epsilon = 1.486 \)

Cell Data: Space Group: \( P4_12_12 \)

\[ a = 6.783(1) \quad c = 18.288(2) \quad Z = 4 \]

X-ray Powder Pattern: Synthetic.

\[ 4.25 \ (100), 4.57 \ (40), 2.964 \ (20), 4.64 \ (18), 2.721 \ (18), 2.571 \ (14), 3.39 \ (12) \]

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SO(_3)</td>
<td>30.32</td>
<td>29.77</td>
<td>30.46</td>
</tr>
<tr>
<td>FeO</td>
<td>0.63</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>CoO</td>
<td>0.12</td>
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</tr>
<tr>
<td>NiO</td>
<td>26.87</td>
<td>28.31</td>
<td>28.42</td>
</tr>
<tr>
<td>MgO</td>
<td>0.65</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>CaO</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H(_2)O</td>
<td>[41.53]</td>
<td>40.35</td>
<td>41.12</td>
</tr>
</tbody>
</table>

Total [100.00] 99.60 100.00

(1) Cottonwood Canyon, Nevada, USA; H\(_2\)O by difference. (2) Jáchymov, Czech Republic; H\(_2\)O by TGA, corresponds to \((\text{Ni}_{1.01}\text{Mg}_{0.04}\text{Ca}_{0.02})\Sigma=1.07\)\(\text{S}_{0.99}\text{O}_4\cdot 5.99\text{H}_2\text{O}\). (3) \text{NiSO}_4 \cdot 6\text{H}_2\text{O}.

Polymorphism & Series: Dimorphous with nickelhexahydrite.

Occurrence: An uncommon secondary mineral in the oxidization zone of nickel-bearing hydrothermal mineral deposits, formed from H\(_2\)O solution between 31.5 °C and 53.5 °C.

Association: Nickeline, gersdorffite, nickelian pyrite, morenosite, chalcanthite, annabergite.

Distribution: Crystallized from Minasragra, 46 km from Cerro de Pasco, Peru. In the USA, in Cottonwood Canyon, at the Nickel and Lovelock mines, Table Mountain district, Churchill Co., Nevada; from the Gap Nickel mine, Lancaster Co., Pennsylvania; at Mine La Motte, Fredericktown, Madison Co., Missouri. From Key Lake, Saskatchewan, Canada. In Germany, at Lichtenberg, near Bayreuth, Bavaria; at Lobenstein, Thuringia; and from Antweiler, Eifel; in the Rammelsberg mine, near Goslar, Harz Mountains. From “Menimuir Burn”, near Cassencarie, Kirkcudbrightshire, Scotland. At the Newdigate colliery, near Bedworth, southwest of Nuneaton, Warwickshire, England. From the 132 North nickel mine, 4 km southwest of Widgiemooltha, and at Kambalda, 56 km south of Kalgoorlie, Western Australia. In the Allarechensk deposit, Kola Peninsula, and from the Noril’sk region, western Siberia, Russia. At Chelniec, Poland. From Jáchymov (Joachimsthal), and near Srníkovec, about 10 km north-northeast of Mariánské Lázne (Marienbad), Czech Republic.

Name: To honor Jan Willem Retgers (1856–1896), Dutch physical chemist and chemical crystallographer, who studied the crystallography of many synthetic compounds.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 100822.


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