Mawsonite

\[ \text{Cu}_6^{1+} \text{Fe}_2^{3+} \text{Sn}^{4+} \text{S}_8 \]

Crystal Data: Tetragonal. Point Group: \( \overline{4}2m \). Typically as rounded to irregular inclusions, to 1.3 mm, exsolved from bornite.


R1–R2: (400) 15.0–19.0, (420) 16.0–20.0, (440) 17.1–21.0, (460) 18.6–22.0, (480) 20.3–23.1, (500) 22.5–24.2, (520) 25.0–25.3, (540) 28.1–26.4, (560) 31.2–27.4, (580) 33.8–28.5, (600) 36.4–29.6, (620) 38.5–30.8, (640) 39.9–32.0, (660) 40.9–33.1, (680) 41.4–33.8, (700) 41.6–34.4

Cell Data: Space Group: \( P\overline{4}m2 \). 

\[ a = 7.603(2) \quad c = 5.358(1) \quad Z = 1 \]

X-ray Powder Pattern: Mt. Lyell, Tasmania, Australia. 

3.09 (100), 1.895 (80), 1.618 (60), 2.680 (50), 1.063 (50), 1.232 (30), 5.37 (20)

Chemistry: 

<table>
<thead>
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<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
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<th>(6)</th>
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<tr>
<td>Cu</td>
<td>44.3</td>
<td>45.0</td>
<td>43.91</td>
<td>10.4</td>
<td>11.8</td>
<td>13.67</td>
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<tr>
<td>Fe</td>
<td>12.5</td>
<td>11.8</td>
<td>12.87</td>
<td>33.0</td>
<td>30.3</td>
<td>29.55</td>
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<tr>
<td>Zn</td>
<td>&lt; 0.1</td>
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<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td>100.2</td>
<td>98.9</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) North Lyell mine, Australia; by electron microprobe, corresponds to Cu_{5.42}Fe_{1.74}Sn_{0.68}S_{8.00}.

(2) Tingha, Australia; by electron microscope, corresponds to Cu_{6.00}Fe_{1.79}Sn_{0.84}S_{8.00}.

(3) Cu_{6}Fe_{2}SnS_{8}.

Occurrence: In massive to disseminated hydrothermal copper ores within highly altered volcanic rocks; in skarns; disseminated in altered granites; rare in copper porphyry deposits.

Association: Bornite, pyrite, chalcopyrite, chalcocite, digenite, idaite, stannite, stannoidite, pyrrhotite, pentlandite, tetrahedrite–tennantite, enargite, luzonite–famatinite, kiddecreekite, moilite, bismuth, galena, sphalerite.

Distribution: In Australia, from the North Lyell [TL] and Crown Lyell mines, Mt. Lyell district, Queenstown, Tasmania; and in New South Wales, at the Royal George mine, near Tingha, New England district [TL]. In Bolivia, from Vila Apacheta. In Peru, at the Colquijirca mine, Junín. From the New Brunswick Tin Mines deposit, New Brunswick; the Maggie porphyry copper deposit, 15 km north of Ashcroft, British Columbia; and at the Kidd Creek mine, near Timmins, Ontario, Canada. From Bisbee, Cochise Co., Arizona, USA. At Neves-Corvo, Portugal. From Chizeuil, Saône-et-Loire, France. At Tsumeb, Namibia. In the Khayragatsch and Kochbulak gold deposits, Chatkal-Kuramin Mountains, eastern Uzbekistan. At the Akenobe, Tada, and Ikuno mines, Hyogo Prefecture; the Ashio mine, Tochigi Prefecture; the Fukoku mine, Kyoto Prefecture; and the Konjo mine, Okayama Prefecture, Japan. In the Ulsan mine, Kyongsang Province, South Korea. Now known from a number of other localities.


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