Ferrokesterite

\( \text{Cu}_2(\text{Fe, Zn})\text{SnS}_4 \)

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**Crystal Data:** Tetragonal, pseudocubic.  **Point Group:** \( \text{T} \).  Massive, granular, to 0.5 mm.

**Physical Properties:**  **Cleavage:** Distinct on \{110\}; a parting on \{001\}.  **Hardness:** \( \sim 4 \)  
\( \text{VHN} = 228–255, 238 \) average (100 g load).  \( \text{D(meas.)} = \text{n.d.} \)  
\( \text{D(calc.)} = 4.490 \)

**Optical Properties:**  **Opaque.**  **Color:** Steel-gray; medium gray in reflected light.  **Streak:** Black.  **Luster:** Metallic.  **Anisotropism:** Weak; in shades of gray.  **Bireflectance:** Weak.  
\( R_1–R_2: 23.9–26.8 \) (470), 26.0–27.0 (546), 26.4–27.3 (589), 26.0–26.8 (650)

**Cell Data:**  **Space Group:** \( \text{I\bar{T}} \) (by analogy to kesterite).  
\( a = 5.433(36) \)  
\( c = 10.883(89) \)

**X-ray Powder Pattern:**  Cligga mine, England.  
3.13 (10), 1.919 (6), 1.110 (4), 2.712 (3), 1.242 (3), 1.045 (3), 0.9182 (3)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu</td>
<td>29.5</td>
</tr>
<tr>
<td>Zn</td>
<td>5.0</td>
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<tr>
<td>Cd</td>
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<tr>
<td>Fe</td>
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<tr>
<td>Mn</td>
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<tr>
<td>Sn</td>
<td>27.4</td>
</tr>
<tr>
<td>S</td>
<td>30.1</td>
</tr>
</tbody>
</table>

Total 100.9

(1) Cligga mine, England; by electron microprobe, corresponding to \( \text{Cu}_{1.99}(\text{Fe}_{0.67}\text{Zn}_{0.33})\Sigma=1.00 \)  
\( \text{Sn}_{0.99}\text{S}_{4.02} \).

**Polymorphism & Series:**  Dimorphous with stannite.

**Occurrence:**  In greisen-bordered sulfide veins in granite.

**Association:**  Arsenopyrite, cassiterite, chalcopyrite, sphalerite, chalcocite, quartz.

**Distribution:**  From the Cligga mine, Perranzabuloe, Cornwall, England [TL].

**Name:**  For its content of iron, ferrum, and relation to kesterite.
