Canfieldite

\((\text{Ag}_8\text{SnS}_6)\)

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Crystal Data: Orthorhombic, pseudocubic. **Point Group:** \(mm2\). Crystals, to 1 cm, with combinations of pseudo-octahedron and dodecahedron; also botryoidal with drusy surface; as small inclusions. **Twinning:** Commonly on \(\{111\}\), as pseudospinel law twins, or repeated interpenetration twins of pseudododecahedra.

Physical Properties: **Fracture:** Conchoidal to uneven. **Tenacity:** Brittle. **Hardness** = 2.5 VHN = 90.7–171 (25 g load). \(D(\text{meas.}) = 6.2-6.3\) \(D(\text{calc.}) = 6.311\)

Optical Properties: **Opaque. Color:** Steel-gray with reddish tinge, tarnishes black with blue to purple tint; pale gray with violet tint in reflected light. **Streak:** Gray-black, somewhat shining. **Luster:** Metallic. **R:** (400) 33.0, (420) 30.8, (440) 28.9, (460) 28.0, (480) 27.2, (500) 26.5, (520) 25.9, (540) 25.5, (560) 25.2, (580) 25.1, (600) 24.9, (620) 24.9, (640) 24.8, (660) 24.8, (680) 24.8, (700) 24.9

Cell Data: **Space Group:** \(\text{Pna}2_1\) or \(\text{Pnam}\) (synthetic). \(a = 15.298(2)\), \(b = 7.548(1)\), \(c = 10.699(1)\), \(Z = 4\)

X-ray Powder Pattern: Synthetic. 3.114 (100), 3.085 (90), 1.8960 (90), 2.727 (70), 1.9129 (70), 3.252 (55), 3.232 (55)

Chemistry:

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<th>(1)</th>
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<th>(3)</th>
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<tr>
<td>Ag</td>
<td>74.10</td>
<td>65.12</td>
<td>73.49</td>
<td>Ge</td>
<td>1.82</td>
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<tr>
<td>Fe</td>
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<td>Te</td>
<td>8.69</td>
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<tr>
<td></td>
<td>Total</td>
<td>99.29</td>
<td>98.33</td>
<td>100.00</td>
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(1) Aullagas, Bolivia. (2) Revelstoke, Canada; by electron microprobe. (3) \(\text{Ag}_8\text{SnS}_6\).

Polymorphism & Series: Forms a series with argyrodite; stable below 172 °C.

Occurrence: In polymetallic veins, formed very late in the paragenetic sequence.

Association: Argyrodite, pyrrargyrite, stephanite, acanthite, polybasite, freibergite, stannite, stannoidite, casseriterite, arsenopyrite, jordaniite, marcasite, pyrrhotite, sphalerite, galena.

Distribution: In Bolivia, exceptional crystals from the Gallofa vein, Aullagas, near Colquechaca, and at the Guadaloupe mine, Chocaya, Potosí. From the Pirquitas deposit, Rionada Department, Jujuy Province, Argentina. In Canada, from about 33 km northeast of Revelstoke, British Columbia. At the Campbell mine, Bisbee, Cochise Co., Arizona, and the Leadville district, Lake Co., Colorado, USA. In the Himmelsfürst mine, Erbisdorf, near Freiberg, Saxony, Germany. From Rejská, near Kutná Hora, and Příbram, Czech Republic. In the Ikuno and Omikani mines, Hyogo Prefecture, and the Ashio mine, Tochigi Prefecture, Japan. At Shuiji, Jianyang Co., Fujian Province, China. From the Karamken Au–Ag deposit, Okhotsk district, and at the Belukhinsk tungsten deposit, eastern Transbaikalia, Russia. Other minor occurrences are known.

Name: Honoring Frederick Alexander Canfield (1849–1926), American mining engineer and mineral collector of Dover, New Jersey, USA.