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Frohbergite from the Kobetsuzawa mine, Sapporo, Hokkaido, Japan

FROHBERGITE, $FeTe_2$, a member of the marcasite group, was identified by X-ray diffraction and EPMA methods in a polished section of ore from the Kobetsuzawa mine, Sapporo, Hokkaido, Japan. Previously, Ishibashi (1956) described gold–silver–tellurium-bearing networks at the Kobetsuzawa mine. The quartz veinlets, in Miocene dacitic rocks, also carry telluride and sulphide minerals. The mineralogy of the quartz veins is reported as native tellurium, tellurantimony (Nakata *et al.*, 1985), altaite, hessite, sylvanite, petzite and rickardite, hematite, sphalerite, galena, stibnite, dycrasite, pyrite and pyrrhotite.

In the specimen studied the telluride minerals occur as irregular grains (<2 mm) in coarse-grained quartz. Frohbergite occurs as small grain (about 50 μm), associated with altaite, pyrite and pyrrhotite (Fig. 1).

In reflected light, frohbergite has a pinkish colour, with no reflection pleochroism, but with strong anisotropism. Polarization colours range from orange-red to inky blue.

Electron microprobe analyses were carried out with a JEOL Model JXA-50A, operating at an accelerating voltage of 20 kV, and a specimen current of 0.02 μA on MgO. Standards used were; natural chalcopyrite for Fe, and synthetic Bi_2Te_3 for Te. Table 1 presents the chemical composition of the frohbergite analyzed.

TABLE 1.

Electron microprobe analyses of frohbergite.

		Fe	Te	Total	Formula(Fe=1)
Wt%	1	18.54	81.49	100.03	
At%		34.15	65.85		$FeTe_{1.93}$
Wt%	2	16.91	82.29	99.20	
At%		31.95	68.05		$FeTe_{2.12}$

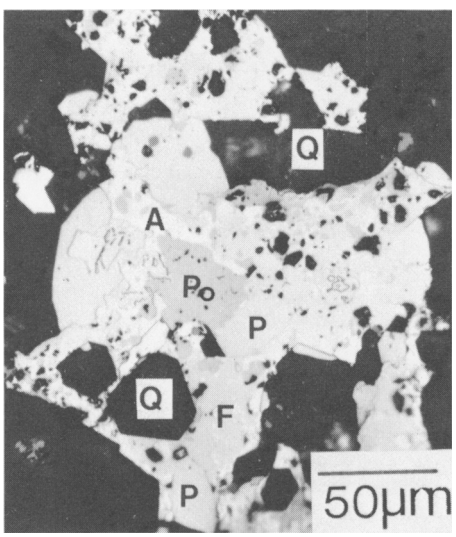

FIG. 1. Photomicrograph of frohbergite (F) associated with altaite (A), pyrite (P) and pyrrhotite (Po) in quartz (Q).

The X-ray diffraction data for Kobetsuzawa frohbergite are in agreement those of frohbergite from the Ross-Montbray mine, Quebec (Thompson, 1947).

Although telluride minerals are relatively common, this is the first frohbergite occurrence in Japan.

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KEYWORDS: frohbergite, Fe–Te system, Kobetsuzawa mine, Hokkaido.

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Wickmanite from Whealcock Zawn, Botallack, Cornwall

THE rare mineral wickmanite, $Mn^{2+}Sn^{4+}(OH)_6$, was first described from Långban, Sweden (Moore and Smith, 1967), where it occurs as brown to honey yellow octahedra up to 2 mm in size in pockets in magnetite ore and in a brecciated jacobsite–richterite–manganophyllite skarn. It was later found in a nepheline-syenite pegmatite at Tvedalen, Norway (Amli and Griffin, 1972), associated with leadhillite and hydrocerussite; at Pitkaranta, Karelia, USSR (Nefodov *et al.*, 1977), in a hydrothermally mineralised skarn; and at Llallagua, Bolivia (Kampf, 1982), where it occurs in pockets in stannite. It has now been found at Whealcock Zawn, Botallack, Cornwall, the first recorded occurrence in the UK, having been confirmed at the British Museum (Natural History) by means of X-ray powder diffraction (film no. 5452F).

At Whealcock Zawn the wickmanite occurs as orange-yellow octahedra, up to 1 mm on edge, showing parallel growth. The wickmanite is found in small cavities in a large axinite pod in a discordant calc-silicate body (Alderton and Jackson, 1978) exposed on the south side of Whealcock Zawn (SW 363 340) which is within the metamorphic aureole of the Lands End granite.

The associated minerals include abundant massive and more rarely euhedral grossular, coarsely bladed dark green pargasite, white prisms of apatite to 50 mm, small white rosettes of titanite, rare pinkish crystals of orthoclase (variety adularia), minor chalcopyrite which is locally altered to botallackite (Barstow, pers. comm.), and an unidentified cobalt-bearing mineral.

It is interesting to note that the locality has also produced crystals of the rare tin silicate stokesite (Couper and Barstow, 1977; Couper and Clark, 1977) and may indeed be the type locality for that mineral.

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KEYWORDS: wickmanite, stokesite, Botallack, Cornwall.

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Cinnabar from the northern Pennines, England

THE first record of British cinnabar is that of Braithwaite *et al.* (1963) who described the mineral from Rutland Cavern, Matlock Bath, Derbyshire. A. W. G. Kingsbury subsequently identified cinnabar from several places on Grassington Moor and Greenhow Hill where, in a few places, the other mercury minerals metacinnabarite, calomel, and native mercury were also found (Dunham and Wilson, 1985). Traces of cinnabar have been noted in pan concentrates of stream sediments from two tributaries of the River Clyde near Abington, Lanarkshire (Dawson *et al.*, 1979) and from streams near the Glendinning antimony deposit, Langholm, Dumfriesshire (Gallagher *et al.*, 1983). Cinnabar is described here as a rare supergene mineral from six localities in the Northern Pennines.

The minerals were identified by X-ray diffraction in the Department of Geology, University of Sheffield.

Coldstones Quarry, Pateley Bridge, North Yorkshire [SE 123 641]. The southern face of this quarry exposes the Garnet Vein (Dunham and Wilson, 1985, p. 209), which here is up to 2 m wide and composed mainly of fluorite, baryte, and calcite with small amounts of galena. Supergene minerals include hemimorphite, smithsonite and traces of aurichalcite and rosasite (D. Green, pers. comm.). In places, irregular cavities lined with smithsonite, hemimorphite, and calcite appear to represent original pockets of primary minerals, probably mainly sphalerite. Cinnabar occurs within these cavities as bright orange-red earthy coatings on the other