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A NEW OCCURRENCE OF ROQUESITE AT MOUNT PLEASANT, NEW BRUNSWICK

J. K. SUTHERLAND AND R. S. BOORMAN, *The Research and Productivity Council, Fredericton, New Brunswick, Canada.*

ABSTRACT

Roquesite ($CuInS_2$) at the Mount Pleasant tin occurrence has small amounts of iron and zinc.

At Mount Pleasant, about 35 miles southwest of Fredericton, New Brunswick, mineralization associated with the Carboniferous volcanism has given rise to a tin occurrence of complex mineralogy.

A mineralogical description of the deposit was made by Petruk (1964) who compared the cassiterite, tourmaline mineralization with that of the Cornwall type of tin deposit. The most abundant minerals are sphalerite, arsenopyrite, pyrite, chalcopyrite, galena, cassiterite and stannite. The less abundant minerals include molybdenite, tourmaline, wolframite, scheelite, hematite, tennantite, chalcocite, digenite, covellite, native bismuth, bismuthinite, wittichenite, glaucodot, marcasite, pyrrhotite, native gold, siderite, goethite, scorodite, arsenobismite and malachite (Petruk 1964), as well as lead-bismuth sulfosalts (Boorman 1968) and the newly discovered roquesite.

Boorman and Abbott (1967) described some sulfide minerals from Mount Pleasant in which the indium occurs in greater concentrations than previously recorded. The weight percent indium in the minerals with which the roquesite occurs is as follows:

Hexastannite	0.04
Chalcopyrite	0.19
Sphalerite	1.25
Tetragonal stannite	2.10

Recent work on the binary join ZnS-In_2S_3 (Boorman Sutherland 1969) shows that the value for sphalerite could represent saturation in indium and indicates that a suite of indium minerals, including the new synthetic phase $Zn_9In_8S_{21}$, could be expected at Mount Pleasant.

In looking for this compound, we encountered the mineral roquesite ($CuInS_2$). This mineral forms subhedral crystals to rounded grains up to 10 microns in size occurring mainly on chalcopyrite and sphalerite grain boundaries. Much smaller grains occur within chalcopyrite and it is

sometimes associated with calcite or fluorite. The roquesite forms less than 0.1 percent by volume of the section examined and, because of its fine-grain size, could not be confirmed by X-ray diffraction. It is light gray with a reflectance similar to that of sphalerite and appears to be isotropic.

Roquesite is known from two other localities. Picot and Pierrot (1963) found it in the copper, tin, iron occurrence at Charrier, France, where the roquesite forms inclusions in bornite. Kato and Shinohara (1968) subsequently discovered roquesite associated with chalcopyrite at Akenobe, Japan. The New Brunswick find resembles the Japanese occurrence because of the association with chalcopyrite rather than bornite.

Microprobe analyses of the Mount Pleasant roquesite are presented in Table 1.

TABLE 1. MICROPROBE ANALYSES

Mount Pleasant Roquesite			Roquesite	Roquesite Picot & Pierrot (1963)
Average of 7 analyses[a]		Ratio	Theoretical $CuInS_2$	
Cu	24.80 (0.45)	1.028	26.20	26.8
Fe	1.44 (0.24)			
Zn	0.65 (0.06)			
In	47.98 (0.30)	1.009	47.35	47.8
S	26.55 (0.32)	2.000	26.45	27.3
Sum	101.42		100.00	101.9

Formula $(Cu_{0.943}Fe_{0.062}Zn_{0.023})In_{1.009}S_{2.000}$.

[a] The error in parentheses is the standard error of the mean of 7 analyses at 95% confidence.

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