

SHORTER COMMUNICATIONS

POITEVINITE,¹ A NEW MINERAL

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In an earlier paper (Jambor, 1962), a salmon-coloured monohydrate sulphate associated with bonattite ($\text{CuSO}_4 \cdot 3\text{H}_2\text{O}$) and an unidentified green iron arsenate was reported from Hat Creek, Bonaparte River, Lillooet district, British Columbia. Chemical analysis indicated that the mineral was a new member of the kieserite group in which copper was the dominant cation. Because the analytical total was less than 98 per cent, and the Cu:Fe ratio was close to 1:1, the mineral was not named. In reviewing the data, Mandarino (1962) suggests that a new name for the Lillooet mineral appears justifiable. A new analysis has therefore been carried out in order to firmly establish the new species.

Approximately 300 mg. of the mineral were picked from the specimen and cleaned under a high-power binocular microscope. About 15 milligrams of the resulting concentrate were dissolved in water and the insoluble residue examined and found to be predominantly minute quartz crystals. In the original analysis cations were determined in triplicate by an x -ray fluorescence method involving fusion of the sample in sodium bisulphate. Such a procedure would result in any contamination from the associated iron arsenate mineral being incorporated in the results.

In the present analysis the cations have again been determined by x -ray fluorescence analysis though using a considerably different technique. In this case, 100 mg. of the mineral were dissolved in water and the filtered solution made up to 25 ml. For the cation determinations, 5 ml. of the filtered solution were removed by pipette and the acidity adjusted to 1 per cent H_2SO_4 using concentrated H_2SO_4 . X -ray standards were prepared by dissolving known weights of stable sulphates of Cu and Fe, and the oxide of Zn in 1 per cent H_2SO_4 . Standard curves were obtained by measuring the characteristic radiation of these elements and subtracting background radiations obtained on 5 ml. of 1 per cent H_2SO_4 stock solution at the wavelength of Zn, Cu, and Fe. The following results were obtained for the Lillooet mineral:

CuO	21.6%
FeO	18.0%
ZnO	3.7%

¹Name approved by the I.M.A. Commission on New Minerals and Mineral Names.

The remaining 20 ml. was used for SO_3 determination and a second 100 mg sample used for the H_2O analysis. The results of the complete analysis are given in Table 1. The cation ratio is $\text{Cu}:\text{Fe}:\text{Zn} = 100:92:17$, thus confirming the earlier indication that copper is dominant.

TABLE 1. NEW ANALYSIS OF LILLOOET MONOHYDRATE SULPHATE

	Insoluble eliminated		Ratio
CuO	21.6	21.84	1.00
FeO	18.0	18.20	
ZnO	3.7	3.74	
SO_3	43.85	44.33	0.96
H_2O	11.94	12.07	1.17
Insol.	1.09		
Total	100.18	100.18	

Analysts: G. R. Lachance and S. Courville.

The formula derived from the above analysis is $(\text{Cu}_{.50} \text{Fe}_{.46} \text{Zn}_{.08}) (\text{SO}_4)(\text{H}_2\text{O})_{1.2}$. The new mineral is named poitevinite in honour of Dr. E. Poitevin, formerly mineralogist of the Geological Survey of Canada. The theoretical composition is $\text{CuSO}_4 \cdot \text{H}_2\text{O}$ with the series poitevinite-szomolnokite ($\text{CuSO}_4 \cdot \text{H}_2\text{O} - \text{FeSO}_4 \cdot \text{H}_2\text{O}$) arbitrarily divided at $\text{Cu}:\text{Fe} = 1:1$. The properties of the Lillooet poitevinite and the theoretical end member are briefly summarized below.

The naturally occurring mineral is very fine grained, powdery to vermicular, salmon-coloured. The hardness is $3-3\frac{1}{2}$, measured specific gravity 3.30, and measured refractive indices approximately α' (?) 1.610, γ' (?) 1.636. The pure end member is pale blue, optically biaxial, $\alpha = 1.626$, $\beta = 1.671$, $\gamma = 1.699$, $2V = 75^\circ$, and has a specific gravity of 3.0-3.3. The Lillooet mineral is monoclinic, space group $A2/a$, a 7.480, b 7.424, c 7.053 Å, $\beta = 114^\circ 40'$, yielding a calculated S.G. of 3.300 for $(\text{Cu}, \text{Fe}, \text{Zn}) \text{SO}_4 \cdot \text{H}_2\text{O}$ with $\text{Cu}:\text{Fe}:\text{Zn} = 100:92:16$ and $Z = 4$. Pure synthetic $\text{CuSO}_4 \cdot \text{H}_2\text{O}$ has lattice constants of a 7.635, b 7.426, c 7.716, $\beta = 116^\circ 09'$ and a calculated S.G. of 3.231 (Pistorius, 1961).

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