SHORTER COMMUNICATIONS

BISMUTHIAN ROBINSONITE

J. L. Jambor and G. R. Lachance
Geological Survey of Canada, Ottawa

Robinsonite, $7PbS \cdot 6Sb_2S_3$, is a rare sulphosalt known to occur only at the type locality (Red Bird mine, Pershing County, Nevada) and at Madoc, Ontario. A new locality was found during the study of kobellite recently reported by Harris *et al.* (1968). The robinsonite specimen, from the Dodger Tungsten mine, Salmo, British Columbia, was kindly loaned to the writers by the late R. M. Thompson. Small lead-grey capillary crystals on the sample proved to be kobellite as described by Thompson (1954) and a small amount of associated massive material suitable for mounting in polished section was found to be bismuthian robinsonite. Microprobe analysis of the robinsonite gave Pb 41.5, Bi 22, Sb 20, S 18%, sum 101.5%, corresponding to 8.92 $PbS \cdot 6(Sb, Bi)_2S_{2.68}$. The antimony-bismuth analytical ratio is 100:64. If $(X)_2S_3$ is accepted as 6, the theoretical weight per cent lead in $7PbS \cdot 6(X)_2S_3$ should be 32.6% as compared to the analytical value of 41.5%. The difference is, however, consistent with the microprobe results reported earlier (Jambor 1967) for robinsonite from the type locality.

X-ray powder patterns of pure synthetic robinsonite and the bismuthian variety from Salmo are almost identical, with the cell of the latter being slightly enlarged. Most of the other differences in the data given in Table 1 arise from the poorer quality of the pattern of the Salmo mineral, the *X*-ray spindle having been prepared from material dug out of the polished section. The slightly enlarged cell of the Salmo robinsonite is in keeping with the atomic radius of the substituting semi-metal, Bi(1.55 Å) being only slightly larger than Sb(1.45 Å).

References

Harris, D. C., Jambor, J. L., Lachance, G. R., and Thorpe, R. (1968): Tintinaite, the new antimony analogue of kobellite, *Can. Min.*, **9**, 371-382.

Jambor, J. L. (1967): New lead sulfantimonides from Madoc, Ontario—Pt. 1, *Can. Min.*, **9**, 7–24.

Thompson, R. M. (1954): Mineral occurrences in western Canada, *Am. Min.*, **39**, 525–528.

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TABLE 1. *X*-RAY POWDER DATA FOR BISMUTHIAN ROBINSONITE, SALMO, BRITISH COLUMBIA, AND SYNTHETIC ROBINSONITE

Patterns obtained with 114.6 mm diameter cameras, Cu$K\alpha$ radiation, and indexed with $a = 16.49$, $b = 17.62$, $c = 3.976$ Å, $\alpha = 95°42'$, $\beta = 96°11'$, $\gamma = 91°14'$, $V = 1143$ Å^3

Robinsonite, Salmo B.C.		Synthetic robinsonite			
I_{est}	d_{meas}(Å)	I_{est}	d_{meas}(Å)	d_{calc}	*hkl*
2B	7.48	2	7.512	7.516	$\bar{2}10$
		1	7.363	7.331	210
2	6.10	2	6.096	6.084	$\bar{2}20$
1	5.46	2	5.468	5.462	300
1	4.38	2	4.379	4.381	040
		<½	4.264	4.267	$\bar{1}40$
3	4.06	4	4.055	4.056	$\bar{3}30$
6	3.94	4	3.960	3.960	410
		3	3.924	3.926	330
3	3.82	3	3.814	3.812	240
7	3.74	2	3.732	3.733	$0\bar{2}1$
		6	3.708	3.708	$\bar{2}01$
2	2.65	4	3.663	3.665	420
<½	3.58	½	3.569	3.569	$\bar{2}11$
1	3.50	2	3.507	3.505	050
		½	3.453	3.450	$1\bar{5}0$
9	3.41	7	3.408	3.407	$4\bar{3}0$
				3.405	$2\bar{1}1$, 150
<½	3.30	<½	3.307	3.311	121
½	3.27	1	3.248	3.253	$23\bar{1}$
3	3.20	3	3.200	3.202	510
8	3.04	8	3.039	3.037	520
				3.036	301
½	3.00	½	3.010	3.010	$\bar{3}\bar{3}1$
½	2.92	2	2.911		
			2.907		
4	2.848	3	2.835		
10	2.781	10	2.767		
3	2.720	5	2.682		
			2.672		
2	2.586	2	2.581		
1	2.537	1	2.534		
		½	2.527		
<½	2.493	<½	2.481		
<½B	2.437	½	2.435		
		½	2.415		
		<½	2.380		
1	2.378	1	2.373		
1	2.345	1	2.342		
<½	2.312	½	2.304		
2	2.278	3	2.274		
½	2.239	½	2.235		
			2.232		
1B	2.189	1	2.195		
		½	2.172		
		<½	2.156		
		½	2.131		
1	2.128	1	2.122		
2	2.106	2	2.105		
		<½	2.083		
½	2.060	1	2.056		

TABLE 1—*Concluded*

Robinsonite, Salmo B.C.		Synthetic robinsonite			
I_{est}	d_{meas}(Å)	I_{est}	d_{meas}(Å)	d_{calc}	*hkl*
		<½	2.020 2.013		
4	2.002	4	1.983		
		<½	1.962		
<½	1.942	½	1.940		
1	1.917	1	1.911		
4	1.891	3	1.884		
2	1.874	2	1.870		
		<½	1.826		
½	1.817	½	1.816		
3	1.797	2	1.796		
<½	1.774	<½	1.778 1.771		
<½	1.755	<½	1.746		
<½	1.740	<½	1.740		
2	1.725	2	1.723 1.717		
1	1.699	<½	1.702		
		<½	1.685		
		<½	1.668		
½	1.676	1	1.661		
		<½	1.656		
		<½	1.637		
		<½	1.621		
		1	1.594		
		<½	1.582		
		<½	1.541		
		<½	1.535		
		<½	1.524		
		½	1.514		
		<½	1.497		
		<½	1.473		
		<½	1.462		
		½	1.449		
		<½	1.431		
		½	1.416		
		<½	1.401		
		<½	1.394		
		<½	1.376		
		<½	1.365		
		<½	1.354		
		½	1.349		
		½	1.339		
		<½	1.331		
		½B	1.310		