Barium-adularia from the Isagosawa Mine, Iwate Prefecture, Japan

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By

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White veinlets traversing through the hematite ore of the Isagosawa mine were found to be composed almost monomineralically of crystals of barium-adularia, which had been analysed by H. SHIRORU with the following results (table 1).

Table 1. Chemical composition of barium-adularia

	wt.%		mol.%
SiO_2	61.12	Or	88.6
Al_2O_3	20.58	Cn	6.6
Fe_2O_3	0.29	Ab	4.0
CaO	0.16	An	0.8
MgO	none		
BaO	3.36		
K_2O	13.87		
Na_2O	0.41		
Igl.	0.30		
	100.12		

The crystalline aggregate of barium-adularia looks quite similar to calcite, showing distinct cleavage faces. It is not transparent, colour white with various shades of reddish brown.

Under the microscope it shows rhombic boundary, characteristic to adularia. Between the crossed nicols we can see mottled extinction of light and an abnormal interference colour, slight indigo-gray.

Specific gravity; $d_4^{11°}=2.585$

Refractive indices; $\alpha=1.520$–1.522

$\gamma=1.526$–1.528

$(-)2V=75°$

An X-ray powder photograph of the barium-adularia confirms its identification (text-fig. 1, no. 1 and table 2, no. 1). It was made in 5.73 cm radius camera with Cu-Kα radiation. A powder pattern of adularia from the Obira mine is compared in text-fig. 1, no. 2 and table 2, no. 2. A little difference between them suggests the smaller size of the crystal lattice of barium-adularia. The authors wish to thank

Tab. 2. X-ray powder diffraction data for barium-adularia and adularia

No. 1 Barium-adularia Isagosawa mine		No. 2 Adularia Obira mine		No. 1 Barium-adularia Isagosawa mine (cont'd)		No. 2 Adularia Obira mine (cont'd)	
I	d(Å)	I	d(Å)	I	d(Å)	I	d(Å)
W	6.60	M	6.63		—	VW	1.428
VW	5.90	W	5.94	M	1.409	W	1.407
	—	VW	5.21	W	1.385	W	1.381
VW	4.64	VW	4.64		—	W	(Q) 1.372
VS	4.25	VS	4.29	VW	1.365		—
W	3.95	M	3.97	W	1.340	W	1.340
VS	3.78	VS	3.80		—	VW	1.328
S	3.49	S	3.50	BW	1.310	W	1.314
VS	3.34	VS	3.36	W	1.289	W	1.289
VS	3.25	VS	3.25	W	1.278	W	1.278
VW	3.14	VW	3.11	W	1.261	M	1.258
S	3.005	S	3.005	VW	1.227	VW	1.228
S	2.919	S	2.919	VW	1.210	VW	1.217
S	2.778	S	2.786	W	1.197	BW	1.197
BS	2.590	BS	2.597	VW	1.181	BW	1.182
	—	VW	2.533	VW	1.158	VW	1.157
	—	VW	2.493	W	1.147	W	1.148
W	2.421	W	2.421	VW	1.127	W	1.124
W	2.390	W	2.390	VW	1.111	VW	1.109
W	2.331	W	2.336	VW	1.099	VW	1.097
	—	W	2.291	VW	1.084	W	1.084
VW	2.225	VW	2.231	VW	1.0540		—
S	2.169	S	2.174		—	VW	1.0348
M	2.130	S	2.135	VW	1.0268		—
W	2.065	W	2.070		—	VW	1.0145
M	2.017	M	2.017		—	VW	0.9911
M	1.975	M	1.979		—	VW	0.9822
M	1.928	S	1.932	VW	0.9702	VW	0.9709
M	1.861	W	1.865		—	VW	0.9626
VW	1.836		—	VW	0.9455	VW	0.9444
VS	1.802	VS	1.806		—	VW	0.9291
VW	1.776	VW	1.779		—	VW	0.9174
VW	1.751	VW	1.754		—	VW	0.8986
VW	1.723	VW	1.726	VW	0.8917	VW	0.8903
	—	VW	1.703	VW	0.8828	VW	0.8807
W	1.679	W	1.682		—	VW	0.8740
	—	VW	1.654	VW	0.8672	BVW	0.8668
W	1.633	W	1.633	VW	0.8548	BVW	0.8552
W	1.594	W	1.594	VW	0.8412	VW	0.8415
W	1.572	W	1.569	VW	0.8299	W	0.8305
W	1.536	M	1.541				
VW	1.518	VW	1.515				
S	1.498	S	1.500				
VW	1.478	VW	1.478				
BM	1.454	BW	1.452				
BM	1.430	W	1.436				

Cu-Kα radiation Camera radius $r = 5.73$cm

VS: very strong
S: strong
} the both edges of broad line

M: medium
W: weak
VW: very weak
B: broad line
Q: quartz

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Text-fig. 1. X-ray powder diffraction photographs of barium-adularia and adularia.

No. 1. Barium-adularia, Isagosawa mine.

No. 2. Adularia, Obira mine.

Barium-containing feldspars were reported in 1940 by T. YOSHIMURA* from the manganese deposits of the Kaso mine, Tochigi Pref. Japan. The iron ores of the Isagosawa mine do not contain much manganese, especially those of the higher iron-content showing the less manganese. But they occur as lense-shaped metasomatic ore bodies in a diabasic dyke which traverses the strata of the Paleozoic formation, and seemingly related genetically to manganese deposits which are found in the Paleozoic region of this country.

* T. YOSHIMURA: Studies on the minerals from the manganese deposit of the Kaso mine, Japan; Jour. Fac. Sci. Hokkaido Imperial University, Ser. IV, Vol. IV, 313-451 (1939).