SHORT COMMUNICATIONS

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Shcherbakovite in leucite phlogopite lamproites from the Leucite Hills, Wyoming

POTASSIUM barium titanosilicates belonging to the shcherbakovite–batisite series are relatively rare minerals, known from only four localities (Schmahl and Tillmanns, 1987). The potassium-rich end-member, shcherbakovite, has only previously been found in pegmatite veins from the Khibina alkaline complex (Eskova and Kazakova, 1954; Sokolova *et al.*, 1964). An intermediate, potassium-dominant member of the series, originally named noonkanbahite, was described by Prider (1965) from lamproites occurring in the West Kimberley region of Western Australia. Prider's (1965) name was subsequently discredited by the IMA and the mineral is currently termed shcherbakovite. This short communica-

FIG. 1. Back-scattered electron image of shcherbakovite crystal(s) occurring in a vesicle associated with apatite, amphibole and sanidine. Emmons Mesa, Leucite Hills, Wyoming.

Table 1. Representative compositions of shcherbakovite.

SiO_2		39.49	39.90	40.72	41.05
TiO_2		24.26	24.55	24.36	24.06
Al_2O_3		0.0	0.05	0.0	0.27
FeO_t		1.26	1.23	1.79	1.48
MgO		0.24	0.19	0.56	0.51
CaO		1.12	1.02	3.01	3.04
Na_2O		6.62	6.86	3.77	4.32
K_2O		8.40	8.71	11.19	10.99
BaO		16.74	15.72	14.14	13.57
Total		98.12	98.23	99.54	99.29
Structural formula based on 14 oxygens					
Si		4.046	4.053	4.066	4.082
Al		-	-	-	0.032
	T=	4.046	4.053	4.066	4.110
Ti		1.870	1.876	1.830	1.799
Fe		0.108	0.105	0.149	0.123
Mg		0.037	0.029	0.083	0.076
	M=	2.015	2.010	2.062	1.998
Ca		0.123	0.111	0.322	0.322
Na		1.317	1.353	0.731	0.834
K		1.099	1.130	1.427	1.395
Ba		0.673	0.627	0.554	0.530
	A=	3.212	3.221	3.034	3.081

1,2 Emmons Mesa, Leucite Hills, Wyoming (this work); 3,4 Walgidee Hills, West Kimberley (Jaques et al. 1986, Mitchell 1985, respectively.) FeO_t = Total Fe expressed as FeO.

tion describes a new occurrence of shcherbakovite from the Leucite Hills, Wyoming, U.S.A.

The Leucite Hills of Wyoming (Cross, 1897) consist primarily of potassic lavas which are currently termed phlogopite lamproites (Mitchell and Bergman, 1991). Shcherbakovite is common within these lavas and is found at Emmons Mesa, Zirkel Mesa and Black Butte, where it occurs as small ($<15\times2\,\mu m$) euhedral blue-green prisms lining the walls of vesicles (Fig. 1). Associated with the shcherbakovite are euhedral prisms of potassium titanium richterite.

Representative compositions of the Leucite Hills shcherbakovite, as determined by conventional electron microprobe methods, are given in Table 1. The composition is in excellent agreement with the general formula of the shcherbakovite–batisite series, $A_3M_2Si_4O_{14}$; where $A=$ [K, Ba, Na, Ca] and $M=$ [Ti, Fe, Mn, Mg, Nb, Zr] (Schmahl and Tillmanns, 1987). Only minor intergrain compositional variation is found with respect to the K and Ba content. Low analytical totals are believed to be related primarily with the difficulty of analysing these very small crystals. Other elements, e.g. Nb, are not present in substantial quantities. As K is dominant over Ba, the mineral is termed shcherbakovite.

Leucite Hills shcherbakovite differs in composition and paragenesis to that occurring in the West Kimberley lamproites. In the latter occurrence, the shcherbakovite is found in pegmatites as large (1 mm) prisms exhibiting a strong golden yellow pleochroism in association with coarse grained crystals of priderite, jeppeite, wadeite, perovskite, titanian phlogopite and titanian potassium richterite. The Leucite Hills material is richer in Ba and Na and poorer in K and Ca relative to the West Kimberley example (Table 1).

The paragenesis of the Leucite Hills shcherbakovite suggests that the mineral has not crystallized directly from the lamproite magma, and may represent an example of vapour-phase crystallization. Shcherbakovite is the most sodic mineral present in the Leucite Hills lamproites and the enrichment in this element must be related to its concentration in late fluids by exclusion from previously-formed phases.

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