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New microlite-group minerals from Volta Grande Pegmatite, Minas Gerais, Brazil

Andrade, M.B.¹ and Atencio, D.²

¹São Carlos Institute of Physics, University of São Paulo, Brazil, mabadean@terra.com.br

²Instituto de Geociências, Universidade de São Paulo, Brazil.

Hydrokenomicrolite, fluorcalciomicrolite and hydroxycalciomicrolite are new microlite-group minerals from the pyrochlore supergroup ($A_{2-m}B_2X_{6-w}Y_{1-n}$) [1] occurring as accessory phases in the rare-element granitic Volta Grande pegmatites, Nazareno, Minas Gerais state, Brazil [2].

Hydrokenomicrolite, $(\square, \text{H}_2\text{O})_2\text{Ta}_2(\text{O}, \text{OH})_6(\text{H}_2\text{O})$, is cubic, $Fd-3m$, $a = 10.454(1) \text{ \AA}$, $V = 1142.5(2) \text{ \AA}^3$, $Z = 8$ [3]. Hydrokenomicrolite is H_2O -dominant in Y-site and vacancy-dominant in A-site. The presence of H_2O was investigated using crystal structure refinements and infrared spectroscopy.

Fluorcalciomicrolite, $(\text{Ca}, \text{Na}, \square)_2\text{Ta}_2\text{O}_6\text{F}$, is the second mineral species with F-dominant on the Y-site described in the microlite-group [4]. The first one was fluornatromicrolite $(\text{Na}, \text{Ca}, \text{Bi})_2\text{Ta}_2\text{O}_6\text{F}$ [5]. The crystal structure parameters are $Fd-3m$, $a = 10.4191(6) \text{ \AA}$, $V = 1131.07 \text{ \AA}^3$ and $Z = 8$.

Hydroxycalciomicrolite is the first described microlite group-mineral which crystallizes in space group $P4_332$, instead of $Fd-3m$ [6]. The simplified formula is $\text{Ca}_{15}\text{Ta}_2\text{O}_6(\text{OH})$. The unit cell parameters are $a = 10.4205(1) \text{ \AA}$, $V = 1131.53 \text{ \AA}^3$ and $Z = 8$. The ordering of Ca cations and vacancies at the A-site are related to the lowering of symmetry from the F - to P -lattice.

References:

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[6] Andrade MB et al. (2013) CNMNC Newsletter 18:3252; Min Mag 77:3249-3258