

## NACARENIOSITE IN PHONOLITES IN THE MECSEK MTS. (HUNGARY) – SECOND OCCURRENCE IN THE WORLD?

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Phonolites are highly differentiated members of the Cretaceous submarine volcanic/subvolcanic alkaline rock suite in Mecsek Mts. (PANTÓ, 1980; DOBOSI, 1987; HARANGI *et al.*, 1996). They are enriched in light rare earth elements (REE) that are hosted mainly by accessory minerals (PANTÓ, 1980). By means of electron microprobe analysis (EMPA) the following accessory REE minerals have been found in the phonolites: britholite  $[(\text{Ce,Ca})_5(\text{SiO}_4, \text{PO}_4)_3(\text{OH,F})]$ ; cheralite  $[(\text{Ce,Th,Ca})(\text{P,Si})\text{O}_4]$ ; nacareniobsite  $[\text{NbNa}_3\text{Ca}_3\text{REE}(\text{Si}_2\text{O}_7)_2\text{OF}_3]$ ; rarely bastnäsite  $[\text{Ce}(\text{CO}_3)\text{F}]$ .

Nacareniobsite was described by PETERSEN *et al.* (1989) from nepheline syenite in South Greenland. It is monoclinic,  $P2_1/a$ , “forms ruler-shaped crystals”. It “belongs to the same group of minerals as rinkite\*, johnstrupite\* and rinkolite\*” (ibid.) (\*Recently all three minerals are taken as synonyms or variants of mosandrite, see JONES *et al.*, 1996). Their published analyses show deficiency in sodium and, in lower extent, calcium, which was attributed to leaching. Since 1989 no other occurrence of this mineral has been mentioned.

Microscopic grains (with up to 140  $\mu\text{m}$  lengths and 10-15  $\mu\text{m}$  widths) of nacareniobsite were found in all of the phonolite occurrences of the Mecsek Mts. They are often idiomorphic or hypidiomorphic, associated with albite and alkali feldspar, sometimes with pyroxene. Their energy dispersive X-ray spectra (EDS) and compositions unequivocally identify them. Based on the REE evolution model established by PANTÓ (1980), this mineral (as well as britholite and cheralite) may have crystallized from the residual melt of the differentiated alkali magma.

This work was supported by the Hungarian Scientific Research Fund (OTKA) program no. T032198, conducted by Gy. Pantó.

### References

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 JONES, A. P., WALL, F. & WILLIAMS, C. T. (1996): Rare Earth Minerals, 1-372.  
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 PETERSEN, O. V., RONSBO, J. G. & LEONARDBSEN, E. S. (1989). N. Jb. Miner. Mh., 84-86.

### Nacareniobsite compositions measured by EMPA

- 1) From PETERSEN *et al.* (1989) (average of 10 analyses)
- 2) In phonolite from Kövestető, Mecsek Mts. (average of 5 analyses)

	1)	2)
SiO <sub>2</sub>	29.63	29.78
TiO <sub>2</sub>	2.79	1.26
Nb <sub>2</sub> O <sub>5</sub>	11.61	14.92
Ta <sub>2</sub> O <sub>5</sub>	0.34	0.00
Na <sub>2</sub> O	10.01	8.34
CaO	19.92	20.54
SrO	0.27	0.40
Y <sub>2</sub> O <sub>3</sub>	0.78	0.66
La <sub>2</sub> O <sub>3</sub>	4.09	4.72
Ce <sub>2</sub> O <sub>3</sub>	10.32	9.21
Pr <sub>2</sub> O <sub>3</sub>	1.42	0.83
Nd <sub>2</sub> O <sub>3</sub>	4.19	2.41
Sm <sub>2</sub> O <sub>3</sub>	0.81	0.36
Eu <sub>2</sub> O <sub>3</sub>	n.a.	0.10
Gd <sub>2</sub> O <sub>3</sub>	n.a.	0.39
Dy <sub>2</sub> O <sub>3</sub>	0.05	0.18
ThO <sub>2</sub>	n.a.	0.71
F	6.87	6.23
Total	103.10	101.03
F=O	2.89	2.62
Total*	100.21	98.40

### EDS spectrum of nacareniobsite

