**Structure of New Rare-Earth Borates $Ln[B_6O_9(OH)_3]$ and its Relation to Boracites**

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The crystal structures of rare-earth borates $Ln[B_6O_9(OH)_3]$, Ln=Sm-Lu, synthesized under hydrothermal conditions, are solved in the space group *R*3*c* (Ln=Ho, *a* 8.385(9), *c* 20,71(4), *R* = 29%, and Ln=Gd, *a* 8.410(4), *c* 20,72(1), *R* = 4.8%). New borates belong to hexaborate group. The polar anionic framework consists of fundamental building blocks FBB [3T+3Δ]: six-membered rings of regularly alternating ($BO_4$)-tetrahedra and ($BO_3$)-triangles. Atoms of Ln and H are located in wide channels along threefold axis. Ln-borates have the closest structural relation to synthetic boracite $Li_4B_7O_{12}Cl$ with the same FBB [1].

Structural relationship between all boracite modifications can be revealed, if to pay attention to clusters of four hexaborate blocks of two types [6T] or [3T+3Δ]. In the cubic boracites $M_3B_7O_{13}Cl$ (M = Mg, Fe) [2] and many synthetic analogues four blocks [6T] are linked via vertices. The trigonal and orthorhombic distortion [3] is caused by increase one of B-O bond and corresponding decrease of B coordination from tetrahedron to triangle. In the cubic $Li_4B_7O_{12}Cl$ such clusters consist of four blocks [3T+3Δ]. In the trigonal $Ln[B_6O_9(OH)_3]$, in comparison with $Li_4B_7O_{12}Cl$, there is one B-atom less, what leads to destruction of such clusters with keeping single six-membered rings.

[1] Jeitschko W., Bither T.A., Bierstedt P.E., *Acta Cryst.,* 1977, **B33**, 2767. [2] Sueno S., Clark J.R., Papike J.J., Konnert J.A., *Am. Mineral.,* 1973, **58**, 691. [3] Dowty E., Clark J.R., *Z. Kristallogr.,* 1973, **138**, 64.

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