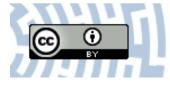


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Title: Kahlenbergite, a New Potassium β-Alumina Mineral : [abstract]

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Ministerstwo Nauki i Szkolnictwa Wyższego

MS14-03 | KAHLENBERGITE, A NEW POTASSIUM & ALUMINA MINERAL

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Kahlenbergite (IMA 2018-158) is a natural potassium β -alumina, with an empirical formula of (K_{0.87}Mg_{0.09}Ca_{0.03}Ba_{0.01})_{s1}(Al_{9.46}Fe³⁺_{1.36}Mg_{0.14}Cr³⁺_{0.02}Si_{0.02})_{s11}O₁₇. It occurs in small hematite segregations within wollastonite-gehlenite rocks. The mineral association suggests formation temperature between 1000 and 1200 °C (Sharygin, 2019). Kahlenbergite forms platy, light-brown crystals, epitaxially replaced and overgrown by hibonite. The unit cell dimensions (a=5.64860(6), b=22.8970(3) Å) and space group *P*6₃/*mmc* of kahlenbergite corresponds to that of synthetic K β -alumina. The crystal structure was refined using synchrotron diffraction data (beamline X06DA, SLS, PSI). Compared to synthetic K β -alumina, which often shows considerable amounts of positional and occupational cation disorder, the structure of kahlenbergite is fairly simple. It exhibits a fully occupied position of the K atom at ($\frac{1}{2}$, \frac

The structure of kahlenbergite and the Fe³⁺-analog of hibonite contain identical blocks, which are connected by *P*-layers in kahlenbergite and so-called *R*-layers in the Fe³⁺-analog of hibonite. The *R*-layers contain Ca atoms, AIO_5 -bipyramids, and further AIO_6 octahedra. Therefore, the connecting layers are most likely the source of the disorder.

[1] Sharygin, (2019) Mineralogical Magazine 83, 123–135