## Borocookeite $LiAl_4(Si_3B)O_{10}(OH)_8$

**Crystal Data**: Monoclinic. *Point Group*: *m.* As dense, massive aggregates or thin crusts and snow-like coatings of flaky crystals, to 0.15 mm.

**Physical Properties**: *Cleavage*: Perfect on {001}. *Fracture*: n.d. *Tenacity*: Not elastic. Hardness = 3 D(meas.) = 2.62(1) D(calc.) = 2.69(1)

**Optical Properties**: Translucent. *Color*: Colorless, light grey with a pinkish or yellow hue. *Streak*: Light pinkish gray. *Luster*: Greasy.
*Optical Class*: Biaxial. $\alpha$ = 1.574(2) $\beta$ = 1.580(2) $\gamma$ = 1.591(2) 2V(calc.) = 72°

**Cell Data**: *Space Group*: Probably *Cc* by analogy with cookeite. $a$ = 5.110(4) $b$ = 8.856(3) $c$ = 14.080(6) $\beta$ = 96.9° Z = 2

**X-ray Powder Pattern**: Malkhan deposit, Chikoy district, Chita oblast, Russia.
3.512 (100), 4.71 (70), 6.99 (50), 2.807 (20), 2.304 (17), 2.304 (16), 2.332 (14)

**Chemistry**:

| | (1) | | (1) |
|---|---|---|---|
| $SiO_2$ | 34.19 | $Li_2O$ | 4.65 |
| $TiO_2$ | 0.02 | $Rb_2O$ | 0.004 |
| $Al_2O_3$ | 41.77 | $Cs_2O$ | 0.005 |
| FeO | 0.06 | $B_2O_3$ | 4.06 |
| MnO | 0.07 | BeO | 0.05 |
| MgO | 0.04 | $H_2O^+$ | 14.17 |
| CaO | 0.08 | $H_2O^-$ | 0.11 |
| $Na_2O$ | 0.01 | F | 1.22 |
| $K_2O$ | < 0.01 | – O = F | 0.51 |
| | | Total | 100.00 |

(1) Malkhan deposit, Chikoy district, Chita oblast, Russia; by wet chemistry, flame photometry and electron microprobe analyses, recalculated to 100% after deduction of 1.91 wt. % admixed quartz; corresponding to $Li_{1.61}Al_{3.80}(Al_{0.44}B_{0.60}Be_{0.01}Si_{2.95})_{\Sigma=4.00}O_{10}[F_{0.33}(OH)_{7.81}]_{\Sigma=8.14}$.

**Mineral Group**: Chlorite group.

**Occurrence**: In miarolitic cavities in gem-bearing, zoned, complex, Li-bearing granitic pegmatite.

**Association**: Elbaite, lepidolite, danburite, boron-rich muscovite, laumontite, quartz, albite.

**Distribution**: From the Sosedka and Mokhovaya pegmatite veins, Malkhan gem tourmaline deposit, Krasny Chikoy district, Chita oblast, Russia.

**Name**: The prefix indicates the boron-dominant analogue of *cookeite*.

**Type Material**: A.E. Fersman Mineralogical Museum, Russian Academy of Science, Moscow, Russia (2522/1).

**References**: (1) Zagorsky, V.Y., I.S. Peretyazhko, A.N. Sapozhnikov, A.P. Zhukhlistov, and B.B. Zvyagin (2003) Borocookeite, a new member of the chlorite group from the Malkhan gem tourmaline deposit, Central Transbaikalia, Russia. Amer. Mineral., 88, 830-836.