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Parascorodite, $FeAsO_4 \cdot 2H_2O$—a new mineral from Kaňk near Kutná Hora, Czech Republic

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ABSTRACT

Parascorodite, a new mineral from Kaňk near Kutná Hora, Central Bohemia, Czech Republic, forms earthy white to white-yellow aggregates associated with scorodite, pitticite, bukovskýite, kaňkite, zýkaite, gypsum, and jarosite, wet chemical analysis gave (in wt%): As_2O_5 44.45, P_2O_5 0.84, SO_3 1.53, Fe_2O_3 34.55, Al_2O_3 0.17, H_2O 17.81, totaling 99.95. The simplified chemical formula is $FeAsO_4 \cdot 2H_2O$. Selected area electron diffraction suggests hexagonal or trigonal symmetry. The extinction symbol is *P*-*c*-. Powder X-ray diffraction yielded unit-cell parameters a = 8.9327(5) Å, c = 9.9391(8) Å, V = 686.83 (8) Å^3, Z = 6. Densities (measured and calculated, respectively) are D_m = 3.213(3) g/cm^3 and D_x = 3.212 g/cm^3. SEM and TEM images showed that basal sections of parascorodite are hexagonal in shape; thicker prismatic crystals were also observed. Crystal size varies between 0.1 to 0.5 µm. The strongest lines in the X-ray powder diffraction pattern are [*d*[I](*hkl*)]: 4.184(44)(012), 4.076(100)(111), 3.053(67)(202), 2.806(68)(211), 2.661(59)(113), 2.520(54)(212), 2.2891(44)(032). Refractive indexes could not have been measured due to extremely small crystallite size, $\overline{n}$ (calc) = 1.797. The TG curve shows two weight losses: at 20–150 °C (2.1 wt%, absorbed water) and at 150–620 °C (15.5 wt%, molecular water), respectively. They correspond to the endothermic peaks on the DTA curve at 120 and 260 °C. Strong exothermic reaction observed at 585 °C reflects formation of the phase $FeAsO_4$. Infrared absorption spectra of parascorodite are close to those of scorodite.