The occurrence of preiswerkite in a tourmaline-biotite-scapolite rock from Blengsvatn, Norway

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ABSTRACT

We report paragenesis and chemistry of a new occurrence of the rare trioctahedral Al-rich sodium mica preiswerkite. The preiswerkite occurs in a tourmaline-biotite-scapolite rock in the contact zone of a gabbroic boudin surrounded by Proterozoic metasediments near the Blengsvatn, Bamble sector, southern Norway. The preiswerkite occurs as subhedral crystals or is intergrown with biotite in a polygonal fabric together with Cl-rich scapolite + tourmaline ± ilmenite ± plagioclase ± corundum. Accessory minerals are hematite, högbomite, spinel, allanite, apatite, and zircon, with relic calcite. Preiswerkite has the compositional range:

(Na1.84–2.02K0.02–0.10Ca≤0.04)(Mg3.13–3.42Fe0.63–0.77VIAl1.87–2.07)(IVAl1.58–3.96Si4.04–4.29S≤0.02)O20[Cl≤0.03(OH)≥3.97]

and coexists with Na-Al-rich biotite, with the composition:

(K1.38–1.61Na0.18–0.45Ca≤0.03)(Mg5.72–3.88Fe1.38–1.43Ti0.10–0.16VIAl0.63–0.83)(IVAl2.71–2.95Si5.07–5.29)O20[Cl≤0.02(OH)≥3.98].

We suggest that the assemblage preiswerkite + biotite + tourmaline + scapolite ± ilmenite ± plagioclase ± corundum was formed during prograde or peak metamorphism in the area, at ~700 °C and 7 kb.