

Petrogenesis of the Kyanite Quartzites at Bosland, Brokopondo, Suriname

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Abstract

This study investigates the formation of the kyanite quartzite deposit at Bosland, Brokopondo, Suriname, South America. It integrates field observations, petrography, XRF and ICP analysis, SEM analysis and thermodynamic modelling in THERMOCALC to put constraints on the petrogenesis. The study area has been the subject of various economic studies to test the feasibility of mining kyanite, quartzite aggregate or a combination of the two, but has never been proven interesting enough. The rocks are characterized by high SiO₂ (72-78 wt%) and Al₂O₃ (15-21 wt%) content and a significant depletion of CaO, Na₂O and K₂O (<1 wt%). Kyanite is found in three forms: 1) in foliation planes; 2) in massive lenses; and 3) in veins. The unusual bulk composition excludes a sedimentary origin and provides evidence for a hydrothermally altered parent rock. These rocks might be classified as High Purity Quartz. P-T pseudosection modelled in the system NCKFMASHTO (Na₂O-CaO-K₂O-FeO-MgO-Al₂O₃-SiO₂-H₂O-TiO₂-O) .