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# Titanium as a cathodoluminescence activator in alkali feldspars

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## Abstract

Albite patches in coarsely mesoperthitic alkali feldspars from the Klokken syenite have oscillatory zoning seen at blue wavelengths using cathodoluminescence. Using a five-spectrometer, high-resolution elemental mapping technique in an electron probe, we show a close correspondence between CL emission intensity and Ti, present at levels up to ~200 ppm. Albite patches were analyzed for major and 16 trace elements by laser-ablation inductively coupled-plasma mass spectrometry. SEM elemental maps acquired simultaneously with the CL showed that a similar zoning pattern is exhibited by Ca, but there is no correlation between CL intensity and Ca concentration. None of the trace elements analyzed correlate with Ti. We conclude that tetrahedral $Ti^{4+}$ is the most likely activator of blue luminescence in these albitic alkali feldspars possibly because of a defect associated with Al-O-Ti bridges.

**Keywords:** Cathodoluminescence, alkali feldspar, perthite