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Tourmaline chemistry in Archaean amphibolite facies supracrustal rocks from West Greenland: a record of growth and alteration

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Bulk rock composition has a significant influence on the chemistry of tourmaline preserved in supracrustal rocks from southern West Greenland. Tourmaline from different rock types may preserve chemical evidence for different stages of growth and metamorphism.

Pelites, mafic schists, and felsic pegmatites from a kilometre-thick Archaean amphibolite facies supracrustal belt in southern West Greenland commonly contain tourmaline. Tourmaline occur as mm– to cm–diameter grains both distributed through the matrix and also forming 'tourmalinite' layers (>90% tourmaline). Tourmaline in these rocks is commonly associated with the occurrence of scheelite and has been previously interpreted as the product of hydrothermal alteration of sediments and mafic volcanics in a volcano-exhalative seafloor environment. Preliminary investigations of tourmaline from pelites, mafic schists and felsic pegmatites indicate that tourmaline may preserve growth zonation related to the early history of these rocks in addition to information on the fluid-rock environment during subsequent amphibolite facies metamorphism.

Tourmaline from pelitic schists are in textural equilibrium with the host rock assemblage – garnet, biotite, plagioclase, quartz, titanite $\pm$ ilmenite – occurring also as inclusions in garnet. They are typically rather homogeneous or have broad concentric zones. They are thought to have grown, or completely recrystallised, during amphibolite facies metamorphism.

Tourmaline from garnet-bearing mafic schists and felsic pegmatites show variable con-

centric, sector, and patchy zonation. Thin recrystallisation zones are present on most grains and in many cases vein-like alteration stems inward from these toward the cores along cracks. Textural features are consistent with partial alteration of early-formed tourmaline during fluid-rock interaction, probably synchronous with amphibolite facies metamorphism.

Electron microprobe and laser-ablation ICP-MS data will be presented.