Microstructure, deformation conditions and partial melting of pseudotachylyte from Tonagh Island, Napier Complex, East Antarctica

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Many pseudotachylytes and foliated pseudotachylytes with ultramylonite bands are found in Tonagh Island, Napier Complex, East Antarctica. Three microstructural types of the pseudotachylytes are distinguished: type A, B, and C. Type A shows flow structures and melting effects in clasts. Type B is mylonitized type A pseudotachylytes. Type C shows no preferred dimensional orientation but melting effects in clasts. Structural relations between pseudotachylytes and ultramylonite bands, nicrostructural features within pseudotachylytes, and geothermobarometries suggest that high strain concentration at plastic deformation resulted in partial to total melting at seismic faulting under retrograde granulite facies conditions.

Pseudotachylytes were formed during D3, D6, and D8 stages in Tonagh Island, Napier Complex, East Antarctica. The D3 and D6 pseudotachylytes occur along ultramylonite bands. Three microstructural types of the pseudotachylytes are distinguished: type A, B, and C. Type A, which was formed during D3 and D6 stages, shows flow structures and melting effects in clasts. Type B, which was formed during D3 and D6 stages, is mylonitized type A pseudotachylytes. Type C, which was formed during D8 stage, shows no preferred dimensional orientation but melting effects in clasts. Structural relations between pseudotachylytes and ultramylonite bands, nicrostructural features of pseudotachylytes, and geothermobarometries suggest that high strain concentration at plastic deformation resulted in partial to total melting at seismic faulting alternated under retrograde granulite facies conditions (lower crustal conditions) both during D3 and D6 stages.