

## COMPARABLE PETROLOGY AND METAMORPHIC EVOLUTION OF THE LIMPOPO (SOUTH AFRICA) AND LAPLAND (FENNOSCANDIA) HIGH-GRADE TERRAINS

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Detailed studies of rocks from the Limpopo (South Africa) and Lapland (Kola-Fennoscandia) high-grade terrains were conducted in order to reveal similar geological and thermodynamic conditions in their formation. Both complexes (1) are situated between the Archean greenstone belts, (2) are younger than the greenstone belts, (3) are bounded by crustal-scale shear zones, (4) have a similar intrusive-like (harpolith) geometry, and (5) show similar reaction textures that reflect both breakdown and growth of garnet in each high-grade terrain. Local mineral equilibria within the textures indicate their successive formation with cooling of the high-grade terrains. Some of the textures in the metapelites must have resulted from reversible reactions  $\text{Grt} + \text{Qtz} = \text{Opx} + \text{Crd}$  and/or  $\text{Grt} + \text{Sil} + \text{Qtz} = \text{Crd}$ . Based on these data, both the decompression cooling and the near-isobaric cooling P-T paths were deduced for both high-grade terrains. The near-isobaric cooling PT-path are characteristics for the marginal zones of both the terrains. All above features suggest similar exhumation mechanisms for both granulitic complexes. The geodynamic consideration of detailed petrological data lead to conclusion that both the complexes were exhumed as giant diapirs (Ramberg, 1981) whose ascent was initiated by the Mantle derived fluid-heat flow (Perchuk et al., 1993). This work was supported by RFBR grants # 96-05-64396, # 99-05-65602 and # 96-15-98470 to LLP and FRD, Gencor and JCI grants to DDVR.