A Boron-Enriched Province in Granulite-facies rocks, Larsemann Hills, Prydz Bay, Antarctica

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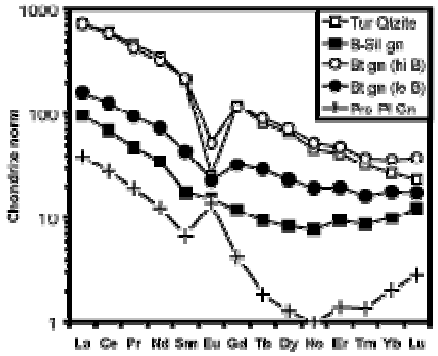
Paragneisses containing borosilicates are found over a 15 km stretch in the Larsemann Hills. B contents reach 11000 ppm, well above the 0.2-16 ppm B in associated metapelites containing Crd, Grt, Sil and/or Hc and the 5 ppm B characteristic of the granulite-facies [1]. Richest in B are massive tourmaline quartzites and well-lineated borosilicate-sillimanite gneisses, which are locally blue-green in colour from abundant, aligned grandidierite prisms. The most widespread B-rich rocks are biotite-plagioclase gneisses containing segregations of cm-sized prismatine and granular tourmaline in cordierite or feldspar. A few B-rich rocks are enriched in P, but most P-enriched rocks, e.g., apatitic quartz granulites (0.6-1.4 wt% P_2O_5) are not enriched in B. Prismatine-plagioclase gneiss, calcic rocks and magnetite rich layers occur locally. Paragneiss Li contents commonly exceed the 30 ppm maximum found in most granulites. Tourmaline quartzites, most biotite gneisses and metapelites are LREE enriched and show marked negative Eu anomalies, whereas prismatine-plagioclase gneisses and borosilicate-sillimanite gneisses show positive Eu anomalies or no anomaly (see Figure). Possible precursors are clastic and volcanogenic rocks altered by submarine hydrothermal processes analogous to those proposed for tourmalinite formation at Broken Hill [2]. Alternatively, epigenetic B metasomatism related to a Fe oxide-Cu-Au hydrothermal system could have played a major role.



Reference

[1] Leeman, W.P., Sisson, V.B. (1996) *Rev. Mineral.*, **33**, 645-708. [2] Slack, J.F., Palmer, M.R., Stevens, B.P.J., Barnes, R.G. (1993). *Econ. Geol.*, **88**, 505-541.