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Geochemical Evolution of the Lithospheric Mantle beneath East Antarctic

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We report petrographic, major and trace (including rare earth) element data for 46 spinel and garnet peridotite xenoliths from East Antarctic (Oasis Jetty) lithospheric mantle beneath Lambert-Amery Rift. The age of hosting ultrabasic alkaline dykes is cretaceous (Layba et al.1987). Investigated spinel and garnet peridotite xenoliths represents about 80 km thick cross of subcontinental litospheric mantle. High equilibration temperatures (820-1217î) of the xenoliths suggests influence of the ascending plume. Distinct correlations is observed between contents of MgO and other petrogenetic elements CaO, Al2O3, FeO, Na2O, Co, Ni, V. Comparison of these correlations with estimated trends of batch and fractional melting of initially fertile mantle peridotite (Niu, 1997) demonstrate, that Jetty peridotites plot at lower values for SiO2 and other components. Garnets are characterized by unusual high LIL element concentrations (Ba/La=4000) and clinopyroxenes from the spinel peridotite suite are highly enriched in LREE [(La/Yb)N =14] and in HFSE. The decoupling of major and REE elements and observed mineral assemblages(which include Sr- and LREE-rich apatite,Ti- Ba-rich phlogopite, titanite, perovskite, henrymeierite) indicate that the upper mantle of East Antarctic has been affected by very strong metasomatism. Henrymeierite was found in mantle material for the first time (Kogarko et al, 2007). It is probable, that that the interaction of primary dolomitic melts-fluids with mantle material according to reactions :2Mg2Si2O6 + CaMg(CO3)2 = 2Mg2SiO4 + CaMgSi2O6 + 2CO2 (1) 3CaMg(CO3)2 + CaMgSi2O6 = 4CaCO3 +2Mg2SiO4+CO2 (2) resulted in wehrlitization and carbonatizationþ. The fluids responsible for this metasomatism were probably derived from the plume that arrived beneath the region at this time.

References 1. Kogarko L.,Kurat G.,Ntaflos T. Henrynrymeyerite in metasomatised upper mantle of Eastern Antarctica (2007) Can Min V45,part 3 2. Laiba, A.A., Andronnikov, A.V., Egorov, L.S. & Fedorov, L.V. (1987): Stock and dyke bodies of alkaline ultrabasic composition in Jetty Peninsula (Prince Charles Mountains, East Antarctica). in Ivanov, V.L. & Grikurov, G.E. (eds) Geological-geophysical investigations in Antarctica. Leningrad. 35-47. 3. Niu Y. (1997) Mantle Melting and Melt Extraction from Abyssal Peridotites: J.Petrology,V 38,8, 1047-1074