# Relationship between large igneous provinces and kimberlites of the Siberian craton

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Two carefully dated large igneous provinces (LIP) represented by flood basalts are known within Siberian craton: Viluy province, with $^{40}Ar/^{39}Ar$ age of 373.4±0.7 Ma [1] and largest terrestrial province with U/Pb age of main pulse 252 Ma [2]. The main activities of kimberlite magmatism are closely related in time with both provinces: 362-344 Ma and 245-226 Ma [3] and started just after LIP emplacement.

We report here on unusual compositional features of olivine macrocrysts from extremely rare hypabyssal varieties of some diamondiferous kimberlites represented complete lithosphere cross section of Siberian craton at different ages. Udachnaya (Devonian), Malokuonapskaya and two pipes from Kharamay field (Triassic) were selected. Concentration of Ni, Mn, Co, Ca, Cr, Al, Ti, P, Na and Zn were measured by EPMA using an innovative method with precision of 5-10 ppm [4]. Homogeneous cores of zoned olivine with Fo 77.3-93 of Malokuonapskaya pipe are different in compositional range from those of Udachnaya olivines (Fo 85-94) [5]. The compositional range of olivines from Triassic kimberlites is also extended to the higher contents of Fe, Al, Ca, Cr and Ti at the same Fo content.

The obtained features of olivine cores compositions in kimberlites likely reflect refertilisation of deep lithospheric mantle as a result of interaction with thermochemical mantle plume loaded by recycled crust [6]. The largest lithosphere refertilisation effect is indicated just after emplacement of Perm-Triassic Siberian LIP (245 Ma) and lasted at least for few tens million years.

References:
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