



Variations of the Fe# of garnet, olivine and other peridotite minerals in the mantle columns beneath the Yakutian kimberlites.

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Yakutian kimberlites are referred to the three major stages: dominate diamondiferous Upper Devonian (UD) kimberlites, Low Triassic (LT) and Upper Jurassic (UJ) contain xenocrysts of pyropes which reveal different P-Fe# trends. The main stage in UD show the trends which are nearly subvertical with the small increasing of the Fe to the SCLM base and to the top, especially at the places of the prevailing or simultaneous basaltic magmatism. Several subtrends with negative inclination probably reflect the primary subduction characteristics. The trend of the pyrope inclusions in diamonds commonly are slightly more Mg-rich and reveal rather high variations of Fe# 5-10 and represent several pressure intervals. The trend for Aykhal pipe revealing increasing from 5 to 8% and several more Fe-rich subtrends. The marginal kimberlite fields Tumanshet show trend of increasing Fe starting from 60 kbar and decreasing downward while Mura-Kovinskoe field show common subvertical trend with the variations within the separate intervals an opposite the trend for Ingashi lamproites reveal continuous Fe rise downward.

The LT kimberlites in northern regions show the trends with continuous rise of Fe# to the upper part of mantle determined as pyroxenitic trend. The rapid increase is typical in the basaltic trap (30-10 kbar) possibly associated with PT traps. But Manchary field show unusual trend with the sharp Fe# increase to the top and bottom. The pyropes from Chompolo show high variation of Fe in several separate levels from 8 to 15 at 40 kbar and even higher within the basaltic trap.

In the UJ the pyrope trends specially in show mostly pyroxenitic trend with the fast rising of Fe#.

The reasons of the variations of Fe is different, For the Paleozoic kimberlites the SCLM have likely mainly primary variations of the subducted slabs especially in lower part of mantle section. The Mg-rich associations at the basement is a result of the interaction of the fluid-rich melts mainly in Archean time.

The reasons of variation interaction with the mantle melts. The fluid-rich melts produced essential depletions, the basaltic ascending trap basaltic melts create the increasing Fe within the extended interval from SCLM base to top. The alkaline basalts mainly interact within the upper part of mantle sections. The protokimberlites mainly affect the form from the base to 41 kbars. And the lamproites which are more Fe#-rich may produce the decreasing Fe trends from the base to top.

The temporal changes of mantle Fe# 8 in Archean 9 Proterozoic and 10 (Griffin, O'Reilly, 2003) show in the reality even Proterozoic Permian SCLM there are three separate P-Fe# trends 5, 7 and 9% increasing upward. Similar trend for Dharwar kimberlites have Fe# 7-10% variations.

Paleozoic kimberlites Baltica are similar to Siberian. The Wyoming SCLM is rather Mg-rich. The SCLM for Mozambique kimberlites in Africa and Canada show many trends to 15% spreading upward.

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