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Cr-Pyropes and other mantle diamond-associated minerals from placers on Tumanshet river (Birysa basin).

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Pyropes from the tributaries of Tumanshet r. (Birysa basin) were studied by EPMA and LAM ICP methods. It Saranchet and Kharyuzovka placers rounded and pyropes (to 13% $Cr2O_3$) are associated with Ti –chromites, rare picroilmenites (to 9% MgO and Cr-1-4%), Mn – ilmenites, low Na- Cr diopsides, hydro- garnets (to 2% $Cr2O_3$). In Slyudyanka in addition Cr- ruby (to 2.5%) and chromites to 60% Of $cr2O_3$ are associated with pyropes. All placers are located within Poima – Buryusa paleo gulf constituted by carboniferous limestones. Pyropes from the upper stretches of small tributaries became fine grained less rounded and less in $Cr2O_3$ (to 8%). Finding of diamonds locates at the boundaries of limestone deposits including the Shelehovo placer. Basal conglomerations contain only Cr-low pyropes and Mg- rich(7- 9%) almandines. LowNa Cr- diopside common in this area are from alnoites like those form Bushkanayskay dyke (Minaeva Egorov, 2009)/ The Pyropes in placers possibly came from the phreatic kimberlite or lamproitic magamtism in paleo gulf which started close in time to the kimberlites in Central Yakutia (D-C boundary) and continued to 300 ma (Ingashisky lamproites) and possibly to Jurassic (alnoites).
The trends P (kbar)- Fe# differ for three localities of pyropes: Muro Kovinsky – 200 to north reveal the typical Paleozoic trend with slight increasing of Fe to the top and bottom of sublithospheric mantle (SCLM). Judging by abundance of ilmenites and TRE of garnets – source of placer was typical for the D-C kimberlites. The pyropes from Tumanshet locality show unic trend Mg –rich in basement (typical for the diamond inclusions) and increasing in upper part which is common for Jurassic post superplume kimberlites in Northern part of Siberian platform with inflection near 40 kbar. The garnet trend from Ingashi lamproites reveal gentle decrease of Fe# (10%) starting from the basement to the top (7%). The rarity of picroilmenites and frequency of Ti – enrichment in chromites in Tumanshet placer evidences that the source was essentially H_2O rich magmas kimberlite II or lamproites. Trace elements for all these localities in southern part of Siberian craton essentially differ (Egorov et al in press). The garnets from Muro- Kovinkoe shows typical primive mantle lherzolitic rounded distributions. The garnets from Ingashi lamproites show LREE enrichment. And the Tumanshet garnets reveal motley distributions from S- type (basement) to magmatic HFSE enriched in middle part of SCLM.
Thermo-barometric reconstruction reveal that mantle in deepest part of SCLM (80-60 kbar) was not subjected to essential malt interaction. The intraction with H_2O bearing plume melts starts from 60 kbar to the 40 kbar boundary/ And upper part was subjected to the refertillizarion within the trap for picro basaltic magmas Thlithospheric keel which, was excited by proto-kimberlitic magma at level 65 -75 kbar.
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