



New data for Eclogites and mantle xenocrysts and megacrysts from kimberlites of Dharwar craton , southern India.

Igor Ashchepkov (1), Subramanian Ravi (2), Shiva Shankar Nayak (3), Felix Kaminsky, (4), Theodoros Naflos (5), and Nikolai Vladykin (6)

(1) Institute of Geology and Mineralogy SD RAS, Koptyug ave 3, Novosibirsk, Russia, (2) Geological Survey of India, Bandlaguda Complex, Hyderabad 500068, Ind, (3) Geological Survey of India, Kumaraswamy Layout, Bangalore 560078, (4) KM Diamond Exploration Ltd. 2446 Shadbolt Lane, West Vancouver, BC, V7S 3J1 Canada, (5) Vienna University, A-1090Vienna, Austria, (6) Institute of Geochemistry SD RAS, Irkutsk, Russia

Eclogitic mantle xenoliths from Proterozoic (1100) Kalyandurg kimberlite field (KL-4 pipe) Dharwar craton, India as well as the xenocrysts from pipes Wajrakarur kimberlite field pipes and others were analyzed by EPMA and LAM ICP MS methods.

The eclogites (often with kyanite) (Patel et al., 2006) are composed mainly from garnet and Cpx, intergrain material is mainly represented by the carbonates and Ca- silicates. Garnets reveal Hi- CaO content to (10-12%) and Cpx are omphacites very low in FeO (1-3%) high Al₂O₃ (8-14%) and Na₂O (2-6 %) differing from the studied samples (Patel et al., 2009). The typical grossspidites (with kyanites coesite, K-Cpx and sanidine) have irregular compositions of minerals and fingerprint structures probably related to the crystallization from fluid.

The compositions of the Cpx from Wajrakarur and other pipes reveal Hi - Cr₂O₃ (5%) content often higher than FeO and Na₂O (4%). Garnets are in Lherzolite field in CaO - Cr₂O₃ (to 12%) diagram.

Ilmenites with TiO₂ variations (58-42%) show two trends of Cr₂O₃ enrichments accompanied by the general NiO and V₂O₅ decrease.

Trace elements for eclogitic Cpx reveal high La/Ybn ratios, Eu peaks and flattened HREE. Garnet REE are not equilibrated and highly inclined. The TRE spiderdiagrams show depletion in HFSE (Ta>Nb), the most depleted show Y through for most depleted varieties. Garnets reveal U peak but low Sr CPx peaks in both Ba and Sr.

The REE patterns Cpx xenocrysts from Wajrakarur are very similar in shape with varying incompatible part. They are showing high La/Ybn by the order of 2 and small humps in Ce-Pr. Spidergrams show small depletion in Zr-Hf and U and all incompatible elements and through in Pb . The REE of ilmenite xenocrysts show two models: high La/Ybn by 2 orders or nearly flattened patterns. Chromites show depletion in La-Pr elements. Ilmenite's TRE spidergrams show peaks in Nb-Ta and Pb and Zr- Hf .

PTXFO₂ diagrams for SCLM beneath the Wajrakarur and nearby fields show rather thick lithosphere to 270 km divided at least into 8 parts (Naganjaneyulu, Santosh, 2012) and splitting of the geotherms. The garnet geotherms beneath the northern fields mainly refer to LT (35 mwm-2) as well as those traced by primary Cpx and metasomatic Ilm. But most part of ilmenites and partly clinopyroxenes show elevated heating conditions referring to the refertilization after protokimberlite.

The SCLM section in the southern part of province differ from previous one (Griffin et al ., 2009). The SCLM beneath the Kalyandurg field divided in to 5 major units also show LT conditions in lower part of mantle section. The fluctuations of Fe# in section are irregular and higher in Fe. But the upper part from 2.5 to 4.5 GPa show the heated conditions (Patel et al .,2009). Eclogites just trace this interval where the garnets also have higher Fe# in middle as well as in upper part. Grant RBRF 11-05-00060.