

Alluvial diamonds from iron-saturated mantle beneath northeastern margin of Siberian craton

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Diamonds of eclogitic paragenesis are dominant in the placer deposits in the northeastern part of the Siberian Craton. Multiple inclusions and host diamonds carbon isotopes composition are consistent with a mixing model in which they result from the interaction of slab-derived melt/fluid with surrounding mantle [1,2]. A significant portion of diamonds contains black inclusions usually interpreted as graphite or sulphides. Twenty six dark inclusions from the 22 diamonds were exposed by polishing for chemical microanalysis. Inclusions were studied with SEM, TEM and EMP. Fe-C-O melt inclusions in association with with Kfsp, Ol and silicate melt inclusions were identified. Most of the inclusions are heterogeneous in composition and consist of iron carbides, iron in various oxidation states and carbon. Carbides contain impurities of Ni (0-0.6%), Sr (up to 3.4%), Cr (up to 0.8%) Si (up to 1%). Inclusions of wustite and Fe-Ti-O melt were identified in one diamond along with inclusions of Fe-C-O melt. In two cases diamond inclusions found within host diamond crystal. Diamond inclusions are surrounded by a border consisting of wustite and siderite. Inclusions of Fe-C-O melt in alluvial diamonds are best explained by carbonate melt-iron reaction [3].

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[1] Shatsky *et al.* (2014), *Eur. J. Mineral.* **26**, 41-52. [2] Shatsky *et al.* (2015), *Gondwana Research* **28**, 106-120. [3] Palyanov *et al.* (2013), *PNAS* **110**, 20408-20413.