Mantle carbonatite magma in diamond genesis

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Introductory Remarks

Experimental data testify that multi-component carbonatite melt is responsible for genesis of mantle-derived diamond. Studies of origin of deep carbonatite magma by Prof. P.J. Wyllie [1] are greatly applicable.

Parent Medium for Diamond

Heart of diamond-parent matter is carbonate-silicate melt hosting minor components and phases both soluble as phosphate, chloride, C-O-H volatile and immiscible as sulfide, native metal, etc. [2]. Carbonate congruent melting, complete carbonate-silicate melt miscibility and high carbon solubility in the melt are decisive in diamond-parent carbonatite melt origin.

Syngenesis Diagram as Experimental Ground

Experimental criterion of diamond and inclusions syngenesis [2] is crucial for untangling physico-chemical details of diamond origin. Here the first «syngenesis» diagrams for key systems K-Mg-Ca-carbonatite–Ol-Opx-Cpx-Grt-peridotite–diamond and K-Mg-Ca-carbonatite–Omph-Grt-eclogite–diamond at 7.0 GPa are studied. Inhibitory silicate behavior and role of insoluble sulfides and soluble C-O-H volatiles in diamond genesis are also estimated. Genesis of diamond-parent carbonatite melt becomes urgent. Support INTAS 051000008/7938, RFBR 0805/00110.

[1] Wyllie (1977) *J. Geol*. **85**, 87-207. [2] Litvin (2007) *Geol. Soc. Amer. Spec. Pap*. **421**, 83-103.

Magmatic genesis and age constraint of the Wuertagaolemiao granitoid pluton in the Siziwangqi area of Inner Mongolia, China

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The Wuertagaolemiao granitoid pluton in the Siziwangqi area, Inner Mongolia, is located in south of the Erdaojing—Chaganwula—Honggeer suture zone of the Xing-Meng orogenic belt. This pluton is composed of hornblende-syenite, monzogranite and syenogranite. Zircons separated from hornblende-syenite, monzogranite, syenogranite are dated, by using LA-ICP-MS U-Pb method, at 271 ± 18 Ma, 256 ± 3 Ma, 261 ± 2 Ma, respectively, while zircons separated from quartz vein intruded to the pluton is dated at 230 ± 12Ma. Petrochemical analyses show that monzogranite and syenogranite are cala-alkaline, whereas hornblende-syenite is alkaline series, indicating an affinity to A-type syenitic magmas. Therefore, the monzogranite originated from partial melts of over-thickened lower crust and the syenogranite was generated by crystal fractionation of feldspar from the monzogranite. Integration of geochronological, petrochemical and geochronological results implies that the Wuertagaolemiao granitoid pluton was emplaced under extensional enviroment caused by underplating of post-collisional regime [1-3].

[1] Jahn *et al*. (2004) *J. Asian Earth Sci.* **23**, 599–603. [2] Jian *et al*. (2008) *Lithos* **101**, 233–259. [3] Chen *et al*. (2009) *J. Asian Earth Sci.* **34**, 245–257.