High-Mg carbonatitic to water-silicic growth environments of cloudy diamonds from the Malobotuobia kimberlite field (Siberian craton)

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Fibrous diamonds commonly contain polyphase microinclusions that are considered to be direct samples of the high-density fluids (HDF's) from which the diamond grew. The composition of diamond-forming fluids enclosed as microinclusions in fibrous and octahedral diamonds from the Siberian craton have been well characterized for several separate kimberlitic mines [1-2] and placer deposits [3]. So far, carbonatitic to silicic HDF's have been identified, while predominantly saline (brine) microinclusions appeared to be absent in Siberian diamonds. This is in contrast to studies of diamonds from the Kaapvaal and Slave cratons where saline HDF's have been reported [4].

Microinclusions of high-density fluids (HDF's) occur in cloudy diamonds from the Mir and Internatsionalnaya kimberlite pipes (Malobotuobia kimberlite field, Siberian platform). These HDFs are of typical high-Mg carbonatitic composition; a few diamonds contain microinclusions that define a low-Mg carbonatitic to silicic trend. The observed variations are interpreted as resulted from mixing of two contrasting fluids derived from the partial melting mainly of carbonated peridotite (the high-Mg carbonatitic HDFs) and eclogite (silica-rich HDFs and HDFs with high Ca/(Ca+Mg+Fe)). Immiscibility of carbonatitic and silica-rich fluids provides a possible mechanism for the co-existence of the observed HDFs but needs further proof. The uniform carbon isotope composition of cloudy diamonds with high-Mg carbonatitic microinclusions from both kimberlite pipes imply a single peridotitic source.

[1] Zedgenizov et al (2009) *Lithos* **112**, 638-647. [2] Skuzovatov et al (2011) *Rus. Geol. Geophys.* **52**, 85-96. [3] Zedgenizov et al (2011) *Rus. Geol. Geophys.* **52**, 1298-1309. [4] Weiss et al (2015) *Nature* **524**, 339-342.