



Diamonds from Juina-5 kimberlite, Brazil

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The Juina Kimberlite Province (92-95 Ma), situated in a Proterozoic Mobile Belt (1.55-1.8 Ga) SW of the Amazon Craton in Mato Grosso State, Brazil, is the most representative site for sub-lithospheric diamonds worldwide, both in abundance and variety of ultra-deep mineral inclusions. The previously described sources are of diamonds mainly from placers and paleo-placer deposits and from the well documented kimberlite, Collier-4, within the Cinta Larga Basin. The Juina-5 Kimberlite, occurring within a separate cluster ~ 30 Km south of Collier-4 kimberlite, has diamonds comparable to those from Collier-4 with respect to their CL features, N content, N aggregation and $\delta^{13}\text{C}$ composition, but presents distinctively different diamond morphology and mineral inclusions. Juina-5 kimberlite has abundant octahedral diamonds (42%) and macles (46%) compared to Collier-4 stones (11% and 16%, respectively), which are predominantly resorbed. The Juina-5 stones are strongly etched and many have surface coatings of graphite. The different degrees of resorption and etching could be related to T, $f\text{O}_2$, $\text{CO}_2/\text{H}_2\text{O}$ of the transporting kimberlite magma.

Juina-5 diamonds are mostly Type-II (89%) with minor Type IaAB diamonds (>90% N aggregation). $\delta^{13}\text{C}$ of 3 Type-II diamonds is from -14.1 to -26.3‰ which is within previous range (-2.5 to -26.3‰) found for Collier-4 diamonds and Juina alluvial diamonds.

Composite mineral inclusions recovered from Juina-5 diamonds include spinel (hercynite), sulphide, Ti-magnetite, nepheline, stoichiometric enstatite, and TAPP-like garnet.