

Are Juína diamonds, Super Deep Diamonds?

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Super Deep Diamonds (SDD) are known to form at depths between ~300 and ~1000 km in the Earth's mantle [1]. These diamonds as well as their minerals, melts and fluid inclusions are rare natural materials from deep Earth. The aim of this study is to indentify and characterize mineral inclusions in diamonds from Juína, Mato Grosso, Brazil, and hence classify them as SDD (or not).

Twelve diamonds from four different mining sites of Juína were selected according to their inclusions using an Estereo Microscope. The main diamond features were based on crystallographic faces, shape, degrees of resorption, crystal state and intergrowing [2].

Diamond samples are transparent, colorless and present octahedro, octahedro-tetrahexahedral and tetrahexahedral habits. Some diamonds show trigons with positive and negative relief, and hexagons with negative relief. Four diamonds are heavily resorbed and were classified as "unknowing habits", as their shapes are distorted and fragmented. Moreover, three samples show abrasion on the vertices of the quaternary axes, and the others have distinct degrees of resorption. Some crystals present intergorwth, such as contact twins (macle) in {111} or aggregates.

All diamonds have mineral inclusions of different colors. Most inclusions are black and could be carbon spots, oxides or even silicates, such as olivine. Other inclusions are yellow to red, which might indicate garnet. In addition, blue inclusions were observed, and could be sulphides. The next steps consists of Fourier Transform Infrared (FTIR) to determine diamond nitrogen impurities, and Micro-Raman spectroscopy and X-Ray Diffraction analyses using Synchrotron radiation to determine *in situ* the chemical composition of mineral inclusions.

[1] Anzolini *et al.* (2019), *Geology*, **47**. [2] Borges *et al.* (2016), *Lithos*, **182**.