

## FTIR INVESTIGATION OF BRAZILIAN DIAMONDS

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**RESUMO:** 122 diamond crystals from Macaúbas river basin (Minas Gerais) were analyzed by FTIR method. These diamonds are uniformly distributed by total nitrogen concentration (CN) and nitrogen aggregation stage (CN(B1), %). Despite the wide variations of such parameters, any isolated groups of crystals could not be detected. Their share with the CN (B1) value more than 90% is 12%, and with the value lesser than 20% - 13%; the average value of this parameter is 50%. Share of crystals with CN lesser than 100ppm makes 24%, crystals with CN more than 600ppm - 35%, the mean value of this parameter fixed at 500ppm. The average coefficient of the platelets absorption band ( $\alpha B2$ ) for this selection is 6,8cm<sup>-1</sup>, the average value of the band maximum position is 1366,2cm<sup>-1</sup>, the absorption coefficient of the band 3107cm<sup>-1</sup> is 0,5cm<sup>-1</sup>; for crystals with high aggregation stage the same parameters make 18,5cm<sup>-1</sup>, 1364,5cm<sup>-1</sup> and 1,2cm<sup>-1</sup>. Among crystals with high aggregation degree, the high nitrogen-containing ones are characterized by the proportionality of CN(B1) and  $\alpha B2$ . In the low-nitrogen crystals the B2 band is absent or, if present, is quiet below its possible value. Also was investigated collection of diamonds from Juína area (state Mato Grosso). It includes 55 crystals of -2 + 1mm size. They are represented by chips and splinters with fragments of rounded natural surface (18%), by rounded chips and splinters (14%), fresh splinters (24%), rounded intergrowths and polycrystals saturated with gray inclusions (44%). Collection from Juína area, as compared with diamonds from the Macaúbas river, contains a bit more of crystals with high degree of aggregation (34%), 10% of specimens have the low aggregation degree, and the remaining part of selection is quite uniformly distributed by this parameter, with its mean value 65%. The average CN value is 390 ppm, the share of crystals with CN lesser than 100 ppm is 36%. Obtained results for diamonds from Juína area differs from data published about any known sources of this region, firstly - by the greater CN value, secondly - by the presence of significant amount of crystals with low and intermediate degree of the nitrogen aggregation, corresponding, in traditional interpretation, to temperatures 1100 - 1150°C. Comparison of new data on the Macaúbas river diamonds with results of previous investigations shows the greater values of the nitrogen aggregation degrees (17% and 50%) and the higher average concentrations of nitrogen (370 and 500ppm). These data indicate that in Juína area there are not only diamonds with high and intermediate value of nitrogen aggregation degree, but also there are the relatively low-temperature crystals.

**PALAVRAS-CHAVE:** FTIR; DIAMOND; MACAÚBAS RIVER.