# EBSD analysis of structural heterogeneity in diamonds

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A perfect diamond should be a single crystal with the shape of Plato's octahedron. Like everything perfect, this object is absent in the reality. We have carried out a study of diamonds with different internal inhomogeneities using the back-scattered electron diffraction EBSD. In the report, we will show that the misorientation of the structure, the split of diamond crystals into subgrains is the more often event than it is usually assumed. We will show the features of the internal structure of coated diamonds. A coat, despite its normal or fibrous growth, retains the orientation of the original crystal. If a coat grows on a single crystal, then it remains single crystal. If the coat grows on a polycrystal, it is accordingly polycrystalline. An EBSD maps of classic polycrystalline diamond – in ballases and carbonadoes will be shown. We will show also cases of cracking, disorientation and regeneration of diamond crystals. The splitting due to the high concentration of impurities will be discussed. We will show the cases of post-growth diffusion of impurities along subgrain boundaries. We have identified 60° twins with a thickness of 60-600 nm, in plastically deformed crystals. At the intersection of twins, <110> etching channels (Rose channels) are observed in some cases. Rose channels are not a violation of continuity as a result of twinning. The channels arise after the etching along weakened lines. Thus, the EBSD method allows one to obtain new data on the real structure of even such a well-studied mineral as the diamond is.