# THE GENETIC TYPES OF NATURAL DIAMONDS.

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Diamond is a polygenetic mineral,which is generated not only in the Earth interiors but also during the high velosity impact of cosmic bodies and by the vapor condensation of interstellar matter. Probably the diamonds distribution correlate in a hole with the carbon abundance.The atomic ratio C/Si can be avaluates in the Earth crust as $I.8 \cdot IO^{-3}$,in the mantle O.I and in the Space I25. Now it is possible to distinguish the mantle magmatic,crust magmatic,shock metamorphic and condensational types of the diamond origin.

The mantle diamonds still is known only in the Earth,but its existance is quite possible in the interiors of the Lunar and grater cosmic bodies.It can be realised because in the initial matter of the Planets,if it is of the carbonaceous chondrite type, is the sufficient content of C.

At the Earth mantle the diamond was formed by the high P-T paramiters in the static conditions.It represents by the ultrabasic (peridotite) diamond,basic (eclogite) diamond and by the diamond of the rocks with intermediate composition (garnet pyroxenite).These diamonds were intruded in the Earth crust by the kimberlitic and lamproitic magmas.The most possible parameters of its crystallisation are $P \approx 4.5\text{-}6$ GPa; $T \approx I000\text{-}I500^{\circ}C$.The crystal growth of diamond is diffusional and is the result of chemical reactions with hydrocarbons participation and by the graphite-diamond transition.

The diamond of metamorphic rocks quite differ from the mantle diamond and forms small (n-IO·n microns) cubic and skeletal crystals and aggregates.One will suggest that this diamond was formed by the lower papameters,probably at the expense of disperse organics.The The forms of diamonds bring in evidence the supersaturation by the

carbon and high speed of crystal growth and cooling.As N.V.Sobolev and others suppose this type of diamond was formed in the crust.

The shock metamorphic diamond of meteorites and impactites was formed by the graphite-diamond transition in the shock waves.The "compulsory" diffusion and the other ways and also geometric models of graphite-diamond transition,which ensure the approximate coherense between the initial and new phases,are discussed.The existence of the lonsdaleite in the impact diamond is possible only in a form of very small crystallites.With the extension of its dimensions the cubic diamond phase become more advantageous energetically.In the case of shock metamorphism of poor graphitised organics the weakly crystallized cubic diamond is appeared.The optimum parameters of shock graphite-diamond transition and its chilling is estimated for the Earth rocks as 50-70 GPa and I000-2000°C for existance of residual temperature duration in melts at the T$\geq$I500°C for the time of order of one day. The positive factor of diamond preserving is the reduce conditions of impact explosure.

The graphite-diamond shock transition is realised in the Earth crust (impactites) and in the iron meteorites at the moment of its impact against the Earth (Canyon Diablo meteorite) and by the shock in the Space (Antarctic meteorite ALHA-77283).

The most high diamond content among the natural materials exist in ureilites - up to I%.In this case the mixture of poor crystallized graphite and small diamond crystals probably are subjected to the influence of shock metamorphism.That reflected in the higher dimensions of the diamond crystallites and in the absense or relatively low content of lonsdaleite.

The colloidal (with 28 Å of middle dimension) diamond was discovered during the last years in carbonaceous and ordinary chondrites.The most probably this diamond is formed by interstellar gas condensation.The problems of its origin is still discussed.