

Movement of Metallic Inclusions in the Volume of Synthetic Diamonds at High Pressure and High Temperature in the Temperature Gradient Field

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Abstract : Several synthetic HPHT diamonds with metal inclusions have been studied. To have possibility of investigate the movement and transformation of the inclusions in the volume of the diamond the samples parallele-piped like shape has been made out of diamond crystals. The calculated value of temperature gradient in the samples of diamond which was placed in high-pressure cell was about 5-10 grad/mm. Duration of the experiments was in range 2-16 hours. All samples were treated several times. It has been found that the volume (dimensions) of inclusions, temperature, temperature gradient and the crystallographic orientation of the samples in the temperature field affects the movement speed of inclusions. Maximum speed of inclusions' movement reached a value 150 $\mu\text{m/h}$.

Keywords : diamond, inclusions, temperature gradient, HPHT

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