

Diamond Synthesis Using Plasma Chemical Vapour Deposition Method on Different Substrate Materials at Close to Atmospheric Pressure Conditions

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Our work is concerned with the preparation, investigation and optimisation of DC plasma chemical vapour deposition systems for diamond synthesis at different pressure conditions on different substrate materials and substrate pre-treatment methods. A variety of chemical vapour deposition (CVD) methods have been developed over the last years to obtain layer of diamond at low pressure. These methods have led to many applications taking advantage of the exceptional properties of a diamond. However, their properties have to be improved and operational costs reduced.

In this work we used low power (60W and 120W) DC as well as 700W Microwave plasma discharge systems in order to deposit rare modification of nanostructural „cauliflowerlike”, triangulary faceted and cubic high-quality diamond films and polycrystalline particles from hydrocarbon–hydrogen gas mixtures at low pressure on tungsten, molybdenum, nickel and silicon substrates.

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