

## **Development of Crystallographic Textures in Diamond Films**

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Polycrystalline thin films develop a crystallographic texture that is dependent on the environmental conditions during the deposition process. In these experiments, analysis of the preferred orientation plays an important role in understanding the relation between the growth process at the surface of the sample and its final microstructure. Special attention has to be paid to the role of impurities since they are known to disturb the growth process. Their presence can lead to different morphological structures and to different materials properties.

It has been demonstrated in literature that the presence of nitrogen in the gas phase during deposition of diamond thin films by chemical vapour deposition techniques has a large influence on the morphology of the final layer. In the present study, a detailed analysis is given of the development of texture in diamond thin films during the deposition process from the gas phase and the role of nitrogen therein. The preferred orientation of the films were studied using X-ray diffraction as a function of the content of nitrogen deliberately added to the gas phase during the deposition process. The results have been compared with the morphological changes of the sample surfaces. A model has been developed that describes the role of nitrogen during incorporation at the growing diamond {111} and {100} faces.

**Keywords:** diamond, microdiffraction, preferred orientation