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A Study of the Interaction of Charge Carriers and Defects in Diamond

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Abstract content
 (Max 300 words)

It is well known that the presence of defects in diamonds affects the radiation induced response of charge carriers in different ways. Mavunda et al. (2008) have shown that electron spin resonance (ESR), thermoluminescence (TL), Raman spectroscopy and ultraviolet (UV) spectroscopy can be used as tools to characterize synthetic CVD diamond in respect of understanding the behavior of diamond for electronic applications. In this study, the influence of the addition of nitrogen during growth of diamond films is determined using small-spot X-ray diffraction techniques and compared with the morphological structure. Complementary information on average sizes of crystallites, concentration of stacking faults, and population of dislocations in diamond films were obtained from X-ray diffraction profile analysis. The results of small spot X-ray diffraction techniques of diamond films are presented and correlate with results obtained with scanning electron microscopy and energy dispersive x-ray spectroscopy. From this, one can extract information on the spatial distribution of the defects that can influence the charge transport properties.

References

Mavunda. R. D, Nam T. L, Keddy. R. J, Zakary.Y.I, (2008). Appl. Rad. Isotopes, 66, 1128

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