

Nitrogen centers in nanodiamonds: EPR studies

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Abstract

Electron paramagnetic resonance (EPR) and electron spin echo (ESE) at X-band (9.4 GHz) and W-band (94 GHz) have been used to study defects in natural diamond nanocrystals, detonation nanodiamond (ND) with a size of ~ 4.5 nm and detonation ND after high-pressure hightemperature (HTHP) sintering with a size of ~ 8.5 nm. Based on identification of atomic nitrogen centers N0 and nitrogen pairs N2 + detected by means of the high frequency EPR and ESE in natural diamond nanocrystals, atomic nitrogen centers N0 have been discovered in nanodiamond core in detonation ND and detonation ND after sintering. In addition EPR signal of multi-vacancy centers with spin $3/2$ seems to be observed in diamond core of detonation ND. © (2010) Trans Tech Publications.

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Keywords

Defect, EPR, ESE, Nanodiamond, Nitrogen