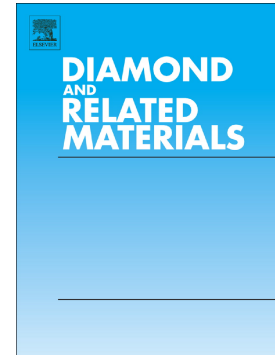


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**Structure dependent negative magnetoresistance of amorphous carbon thin films**

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**Abstract**

Negative magnetoresistance (MR) up to 13% was observed at 2 K under the magnetic field of 7 T in amorphous carbon thin films synthesized by chemical vapor deposition. No tendency of saturation of MR is observed up to the magnetic field of 7 T. Shift of structural morphology from disordered amorphous carbon to ordered graphitic like carbon was studied by using Raman, X-ray Diffraction, High Resolution Transmission Electron Microscopy and X-ray Photoelectron Spectroscopy. Negative MR effect increases with the increase in structural order. The mechanism of this negative MR could be ascribed to the Weak Localization and Grain Boundary Scattering Conduction depending on the different temperature regimes.

**Key words:**

Magnetoresistance; Amorphous Carbon; Transport properties; Weak localization; Grain boundary scattering

**1. Introduction**

Different types of amorphous carbon thin films have been considered for applications to the optical and electronics industry [1, 2]. Among these applications, spintronics application such as magnetoresistance is quite fascinating [3, 4].

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