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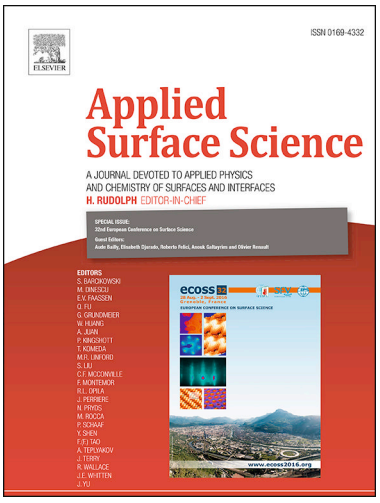

Full Length Article

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Barrier heights of Au, Pt, Pd, Ir, Cu on nitrogen terminated (100) diamond determined by X-ray photoelectron spectroscopy

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Abstract

In this work, we used X-ray photoelectron spectroscopy to measure barrier height values for different metals (Au, Pt, Pd, Ir, Cu) on nitrogen terminated (100) diamond. Three types of diamond surface (hydrogen-, oxygen-, fluorine-terminated diamond surface) were used as the initial surfaces. Then, nitrogen terminated diamond surface was formed by reactive ion etching on the initial diamond surfaces for comparison. Thin films of Au, Pt, Pd, Ir and Cu were evaporated by electron beam to form metal/N-diamond contacts, respectively. The barrier height values for Au, Pt, Pd, Ir and Cu on nitrogen terminated (100) diamond contacts were determined to be 2.37 eV, 2.14 eV, 1.78 eV, 2.20 eV and 1.84 eV, respectively.

Key words:

CVD diamond; XPS; barrier heights; nitrogen terminated.

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