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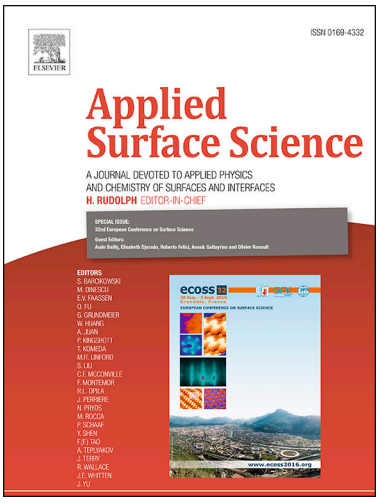

Full Length Article

Adherent and low friction nanocrystalline diamond films via adsorbing organic molecules in self-assembly seeding process

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Adherent and low friction nanocrystalline diamond films via adsorbing organic molecules in self-assembly seeding process

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KEYWORD: nucleation, electrostatic self-assembly seeding, nanocrystalline diamond film, friction, adhesion

ABSTRACT

Deposition of adherent and low friction nanocrystalline diamond films on cemented carbide cutting tools has been realized by application of a self-assembly seeding process with the help of lysine as stabilizing and directing agent. The colloidal stability of as-received detonated nanodiamond (DND) particles was enhanced by simply adding lysine into the nanodiamond seeding solution and adjusting the pH. Due to the two amine moieties it enhances the adsorption of oxidized nanodiamond on negatively charged cemented carbide substrate. The DND particle adsorption and adhesion of nanocrystalline