

**SYNTHESIS OF DIAMOND COATING FROM METHANE GAS IN MICROWAVE
PLASMA ENVIRONMENT**

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ABSTRACT

Thin diamond film can be employed as a protective, hard and inert coating on metallic materials. But, the application of diamond on metal, such as steel material is restricted, mainly because of poor adhesion between diamond films and the metal substrate. Diamond film cannot be formed directly on the steel surface because the precursor gas, methane, simply diffuses into the substrate, thus hindering the diamond nucleation. In this work, a diffusion barrier of carbonitriding layer was employed as a pretreatment process before diamond deposition. It was noticed that an interlayer by plasma carbonitriding was an effective method in improving the nucleation of diamond coating on steel substrate.

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