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Abstract

The production of graphene-based coating usually requires two time-consuming processes of synthesis and deposition. In this study, turbostratic graphene-based material was synthesized and deposited on Ni substrate using ethanol solution as carbon precursor by the cathodic plasma electrolysis process. This process was carried out at the atmospheric pressure and under 800 V within a very short time. X-ray diffraction and Raman spectroscopy at two laser wavelength excitations of 633 and 785 nm confirmed the formation of graphite structure with lower number of graphene layers on the Ni substrate. Studying the 2D band shape, intensity and position at Raman spectrum showed the presence of multi-layer graphene without any stacking order between the adjacent layers. Furthermore, field emission scanning electron microscopy images revealed the formation of carbon coating comprised of turbostratic multi-layer graphene particles on the Ni substrate. The thickness of this carbon coating will be changed with processing time. Likewise, Rockwell C indentation test was conducted to evaluate the adhesion of carbon film to

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