



ID120: Wettability Effect and Performance of Nano-Columnar DLC Coating via Advancing Sessile Drop Method in an Ambient Environment

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.Abstract

Diamond-like carbon (DLC) coating is referred to amorphous carbon (a-C) or hydrogenated amorphous carbon (a-C:H) which has excellent mechanical and tribological properties. It can be used as protective coatings for optical windows and biomedical devices. Apart from that, there has been keen interest in the study of wetting properties of DLC film. The spreading behavior of a liquid on the surface of DLC coating is important to many applications especially in coatings industry. In this study, the DLC coating was produced by using RF-sputtering and then it was undergone the chemical modification via electron beam (EB) irradiation. The experiment of surface wettability of DLC film was investigated under different parameters setting by using sessile drop method. In addition, the advancing sessile drop analysis also has been carried out in order to further study the effect of volume distilled water to the spreading behavior of droplets on the surface of DLC coating. The contact angle of distilled water was measured by using Image J software. The findings of this study indicate that the parameter setting of RF-sputtering and EB-irradiation are the important factors that able to influence the wettability performance of DLC film. Finally, the analysis also is expected can be enhanced the surface quality of manufacturing components in the future.

Keywords: Diamond-like carbon, Nano-columnar DLC, RF-sputtering, Electron beam irradiation, Sessile Drop Method, Wettability, Water Contact Angle