

PROCEEDING OF ICADMMT 2022

International Conference on Advances in Design,
Materials and Manufacturing Technologies 2022

6 Oct (Thu)

9:30 am-5:00 pm

Silverbox Ballroom, Hotel ICON
17 Science Museum Road
Tsim Sha Tsui East

7 Oct (Fri)

9:30 am-1:00 pm

PolyU Hung Hom Bay Campus
8 Hung Lok Road
Hung Hom Bay

Co-organisers :

Biocompatibility of Soft and Hard Diamond-like Carbon Coatings for Biomedical Application

by Ioannis ANESTOPOULOS, Mihalis I. PANAYIOTIDIS, Martin BIRKETT, Abdul Wasy ZIA

Presenter: Abdul Wasy ZIA, Northumbria University

Diamond-like carbon (DLC) coatings are rapidly emerging for biomedical applications due to their superior hardness, Young's modulus, antiwear and biocompatibility properties. DLC coatings have shown their potential to improve bio-mechanical performance of various artificial implants such as orthopaedic joints, orthodontic components, vascular grafts, stents, heart valves and diaphragms, catheters etc. The biocompatibility of DLC coatings is well investigated over other engineering materials and also for different substrate systems. However, the DLC growth which tunes its biocompatibility is not yet systematically investigated. In this work, DLC coatings are deposited with varying bias voltage using a sputtering system. The coatings are characterised to measure changes in atomic structure, hardness, and Young's modulus. The biocompatibility of bias-varied DLC coatings is measured with L929 mouse fibroblast cells. It is observed that soft DLC coatings show better biocompatibility when compared to hard DLC coatings. Hence, hard DLC coatings may not always be the best choice, therefore, DLC with appropriate hardness should be chosen for specific biomedical applications.