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Plasma Based Ion Implantation & Deposition

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Program

Organized by

Shanghai Institute of Ceramics, Chinese Academy of Sciences (SIC CAS)
Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences (SIMIT CAS)

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10:35-10:50	Tea and Coffee
Session Chairs **Marcela Bilek,** University of Sydney, Australia **Dejun Li**, Tianjin Normal University, China **Thursday, October 19, 2017**	
10:50-11:15	Invited talk **Thick hard yet lubricant DLC-based coatings based on ion-assisted interface treatment and coating deposition** *Ricky KY Fu* City University of Hong Kong, Hong Kong, China
11:15-11:30	ID106 **Regulating the uniformity of diamond-Like carbon (DLC) films by co-depositing of electron cyclotron resonance (ECR) plasma and self-sustained discharge plasma chemical vapor deposition** *Qiaoyuan Deng* Southwest Jiaotong University, China
11:30-11:45	ID 96 **Hard yet self-lubricate TiAlN/DLC multilayered coating deposited by high energetic ion-assistant deposition** *Liangliang Liu* Peking University Shenzhen Graduate School, China
11:45-12:00	ID 35 **Synthesis and bioapplications of 2D black phosphorus** *Xue-Feng Yu* Center for Biomedical Materials and Interfaces, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China
12:00-13:00	**Lunch**
13:20-14:20	**Poster Section B (1.0h)** (BEST POSTER EVENT) **Thursday, October 19, 2017**
14:30-	**Buses Set off for City Tour (Banquet)**

Invited Talk

Thick hard yet lubricant DLC-based coatings based on ion-assisted interface treatment and coating deposition

Ricky KY Fu[1], Liangliang Liu[2], Zhongzhen Wu[2], Xiaokai An[2], Shu Xiao[2], Suihan Cui[2], Hai Lin[2], Paul K Chu[1], Feng Pan[2]

[1]Department of Physics and Materials Science, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong, China
[2]School of Advanced Materials, Peking University Shenzhen Graduate School, Shenzhen 518055, China

Abstract: Diamond-like carbon（DLC）films have attractedmuch attention due to its excellentmechanical properties, such as highmicro-hardness andlow friction coefficient. However, due to the high residual stress in the deposition, the thickness of DLC coatings always are limited to 2-4μm. Moreover, the hardness should be compromised with the lubricant property according to the H-doping. Here, we reported a ion-assisted interface treatment method to obtain a super-thick doping-free DLC coating (>50μm) with high sp3 content and excellent lubricant property. And the adhesion is up to 73N. In order to increase the hardness of the lubricant DLC coating, TiAlN is used as a strengthen phaseto constructed a DLC/TiAlN multi-layer coating. The interfaces between the amorphous DLC coatings and the nano-crystallineTiAlN coatings are investigated and the adhesions of each layer are enhanced by morphology control. Both high hardness (>25GPa) and low friction coefficient (<0.2) are obtained on the composite DLC-based coatings.

Corresponding:
Email: rickyfu@plasmatechnol.com
Tel: +852-98814818