



ACMME 2023

The 11th Asia Conference on Mechanical and Materials Engineering

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2023 10th International Conference on Chemical and Biological Sciences

Sapporo, Japan | June 8-11, 2023



Session 3-A

Topic: Applied Catalysis, Material Chemistry, and Material Physics

Session Chair: Prof. Jia-Lin Tsai, National Yang Ming Chiao Tung University, Taiwan

Time: 16:15-17:30, June 9, 2023

Onsite Room: 5D

16:15-16:30	<p>MS23-6227-A</p> <p>Identifying the True Active Species in Ru-based Polymetallic Hydroxide toward Alkaline Hydrogen Evolution</p> <p>Presenter: Dan Li</p> <p>Dan Li, Chao Huang and Paul K. Chu City University of Hong Kong, China</p>
16:30-16:45	<p>MS23-1242</p> <p>Decolorization Kinetics of Azo Dye (Methyl Orange) in Fenton process with High Entropy Alloys as Catalyst</p> <p>Presenter: Norhuda Hidayah Nordin</p> <p>Nur Hudawiyah Abu Hassan, Nor Akmal Fadil, Nur Ayuni Jamal, Farah Diana Daud and Norhuda Hidayah Nordin International Islamic University Malaysia, Malaysia</p>
16:45-17:00	<p>MS23-6126-A</p> <p>Fabrication and Hydrogen Permeation Resistance of dense CrN coatings</p> <p>Presenter: Qingdong Ruan</p> <p>Qingdong Ruan and Paul K. Chu City University of Hong Kong, China</p>
17:00-17:15	<p>MS23-1071-A</p> <p>Effects of Doping and Vacancies in the Electronic Properties of the SiC Monolayer: A DFT Approach</p> <p>Presenter: Lucia G Arellano Sartorius</p> <p>Lucia G Arellano Sartorius, Ranferi Cancino, Francisco De Santiago, Álvaro Miranda and Jun Nakamura Instituto Politécnico Nacional, Mexico</p>

Fabrication and Hydrogen Permeation Resistance of Dense CrN Coatings

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Abstract

Hydrogen embrittlement has become a hot research topic due to the rapid development of hydrogen energy and coating technology is regarded as the most efficient method to mitigate hydrogen embrittlement. However, the grain gaps in coatings frequently serve as paths for hydrogen permeation thus decreasing the protecting effects. In this work, ion bombardment is performed during magnetron sputtering deposition of dense CrN coatings to decrease the formation of grain gaps. The compactness of the CrN coatings is improved by disrupting the growth of grains using energetic ion bombardment. Hydrogen permeation tests reveal that the apparent hydrogen diffusion coefficient and hydrogen permeability of the dense CrN coating 52.6 and 24.1 times less than those of the unprotected substrate. The tensile test also reveals excellent hydrogen embrittlement resistance compared to the X70 substrate and conventional coatings.

Keywords: Hydrogen embrittlement; Coatings; Grain gaps; Ion bombardment

Acceptance Notification and Invitation Letter

The 11th Asia Conference on Mechanical and Materials Engineering (ACMME 2023)

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Qingdong Ruan, Paul K. Chu

City University of Hong Kong, China

Dear Qingdong Ruan and Paul K. Chu

We are pleased to inform you that, after review (please refer to the attached file), your abstract identified below has been accepted for Oral Presentation Only by **The 11th Asia Conference on Mechanical and Materials Engineering (ACMME 2023) to be held in Sapporo, Japan from 8-11 June 2023.**

Abstract ID: MS23-6126-A

Title: Fabrication and hydrogen permeation resistance of dense CrN coatings

You are sincerely invited to present your work and communicate with other distinguished participants at the conference.

For registration details, please refer to the second page of this document.

Yours sincerely,
ACMME 2023 Organizing Committees
March 16, 2023

