

Electrodeposited NiFeCu ternary metal on carbon paper as stable non-noble anode for efficient electrooxidation of ammonia**Speaker:** Zhu Mingke

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Date: 31th Oct 2019, Thursday
Time: 3:00 to 3:30 pm
Venue: EA-06-03

Abstract

Catalysts for the oxidation of NH_3 are critical for various important applications, such as ammonia-based fuel cells, on-board production of high-purity hydrogen, electrochemical removal of ammonia and ammonia detection for environmental protection. However, the sluggish kinetic rates of the ammonia electrooxidation reaction, noble metal included, and poisoning of Pt-based catalysts still remain challenges. This seminar give a talk on a promising NiFeCu ternary metal electrode for the electrochemical ammonia oxidation reaction (AOR) under ambient conditions. The ammonia removal efficiency can reach up to ~90% after 12h under 0.55V vs. SCE, which shows a significant increase of catalytic performance in the field of electrooxidation of ammonia. Besides, systematically calculations is carried out using the density functional theory (DFT) to study the mechanism of ammonia oxidation. A novel reaction path from ammonia to dinitrogen is proposed. The study shows that Cu-Fe co-doped NiOOH have a strong synergistic effect, which can reduce both thermodynamic and kinetic energies significantly comparing to Cu-doped NiOOH.

Zhu Mingke received her B.Sc. degree from the Department of Mechanical Engineering and M. Sc. Degree from the Department of Materials Science and Engineering at Tsinghua University in China. She is currently a Ph.D. candidate in Department of MSE under the supervision of Prof. Xue Jun Min, focusing on the transition metal catalysts materials. Her current research aims to develop an efficiency noble-metal free catalyst for ammonia electrochemical oxidation (AOR).

ALL ARE WELCOME!

Host: A/P Xue Junmin