Contribution ID: **106** Type: **Poster**

Ultrathin molybdenum disulfide/carbon nitride nanosheets with abundant active sites for enhanced hydrogen evolution

Wednesday 20 June 2018 18:00 (20 minutes)

The exploration of highly active catalysts for hydrogen evolution reaction (HER) is beneficial to realize high catalytic activity and enhance kinetics for water splitting. Herein, the flower-like molybdenum disulfide/carbon nitride (MoS2/CN) nanosheets with thickness of 4.6 nm and enlarged interlayer spacing of 0.64 nm were synthesized via a facile hydrothermal method. As expected, the ultrathin thickness endowed MoS2/CN with abundant active sites, ensuring an outstanding catalytic activity and excellent stability for HER in alkaline electrolyte. The MoS2/CN nanocomposite can offer onset overpotential of 153 mV versus reversible hydrogen electrode (RHE). Notably, the Tafel slope is only 43 mV dec-1, which is significantly better than those of reported MoS2-based hydrogen evolution catalysts, revealing the superior HER performance particularly in catalytic kinetics. More significantly, the density functional theory (DFT) calculation further verifies that rich active sites confined in ultrathin nanostructure of g-C3N4 nanolayers could increase the activity of MoS2/CN and result in enhanced HER efficiency. This study indicates that rational interaction between two different 2D materials can significantly facilitate H2 generation, which endows extraordinary HER activity.

Author: Prof. ZHU, Junwu (Nanjing University of Science and Technology)

Co-authors: Dr QIAN, Xingyue (Nanjing University of Science and Technology); Prof. WANG, Xin (Nanjing University of Science and Technology)

Presenter: Prof. ZHU, Junwu (Nanjing University of Science and Technology)

Session Classification: Poster Session Wednesday

Track Classification: Nanometer Structures & Nanotechnology