Department of **Materials Science & Engineering** seminar series 2019

Presents

NICKEL HYDROXIDE NANORIBBONS FOR EFFICIENT WATER SPLITTING AND DIRECT METHANOL FUEL CELL

by *Wang Xiaopeng*

Date: 30 Oct 2019 (Wednesday)
Time: 3pm to 6 pm
Venue: EA-02-15

Abstract

Oxygen evolution reaction (OER) and methanol oxidation reaction (MOR) are very important reactions that are the key components of the hydrogen harvesting system and direct methanol fuel cell (DMFC). However, these two reactions are sluggish processes, due to the multi-proton coupled reactions. In this work, we report the first stabilized non-stochiometric $Ni(OH)_2$ nanoribbons (NR-$Ni(OH)_2$) with alternating 4- and 6- coordinated Ni edge atoms. In OER applications, the NR-$Ni(OH)_2$ exhibits remarkable OER catalytic activity with an overpotential of 162 mV at 10 mA cm^{-2}, which is one of the best OER activity reported among any OER materials reported till date. Traditional $Ni(OH)_2$ can only oxidize the methanol if the potential larger than 1.35 V vs RHE, while NR-$Ni(OH)_2$ is able to exhibit MOR activity at a significantly lower onset potential of 0.55 V vs RHE. This is the first reported non-platinum metal in DMFC operation, and it displays better stability than Pt in extended operations.

Speaker *Wang Xiaopeng*

Biography

Wang Xiaopeng is currently a Ph.D. student in Department of Materials Science and Engineering under A/P Xue Junmin. He received the master's degree from Sichuan University, China in 2015. His research interest is focused on the electrocatalyst and fuel cell.

ALL ARE WELCOME!

Prof Ding Jun **Host**