

TcSUH SPECIAL SEMINAR

Prof. Gongxuan Lu

State Key Laboratory for Oxo Synthesis and Selective Oxidation
Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou, 730000

Wednesday, February 27, 2019

Room 102, Houston Science Center
1:00 p.m. – 2:00 p.m.

The Possibility to Generate Hydrogen via NIR Light via Up-Conversion Photocatalysis, taking CdS/NaYF₄:Yb³⁺-Er³⁺ Photocatalyst as an Example

ABSTRACT: Recently, we established a CdS/NaYF₄:Yb³⁺, Er³⁺/Pt photocatalyst for overall water splitting under near infrared (NIR, 960nm) and visible light irradiation. By combining the NIR-to-visible upconversion (UC) component NaYF₄:Yb³⁺, Er³⁺(NYF) with CdS, the water splitting over CdS/NYF/Pt catalyst has been successfully achieved under NIR and visible light irradiation with significantly enhanced stability. The highest H₂ evolution rate of 101.8 μmol•g⁻¹•h⁻¹ was achieved over CdS/NYF/Pt photocatalyst with 40 wt % NYF. The upconversion material NaYF₄:Yb³⁺, Er³⁺ can up-convert low energy IR light to high energy emission (NIR → visible/UV light, visible → UV light), which can excite CdS to fulfill water splitting under NIR light irradiation.

BRIEF BIO: Professor Lu obtained his Ph.D. in Physical Chemistry in 1993 from the Chinese Academy of Sciences. He became a deputy director of State Key Laboratory for Oxo Synthesis and Selective Oxidation (OSSO) in 1996 and full professor in Lanzhou Institute of Chemical Physics, CAS since then. His research interests include environment-friendly catalysis, catalytic hydrogen production, reusable energy sources conversion, solar energy conversion and storage via photocatalysis. He has published more than 350 papers in those fields. His H index is 55. Currently, he is the deputy chief editor of the *Journal of Molecular Catalysis* (China), fellow of Chinese Renewable Energy Society (Photochemistry Committee), Chinese Chemical Society, and Chinese Catalysis Society.



TcSUH Host: Prof. Zhifeng Ren

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