伦敦大学学院Junwang Tang教授学术报告

报告题目： Fundamental Challenges and Catalysts Development in Solar H_2 Fuel Production

时间：12月21日（星期四）下午 14:30-16:30

地点：中心会议室

主讲人：Junwang Tang 教授

Director of Materials Hub, University College of London (UCL)

主讲人介绍

Prof. Junwang Tang is Director of UCL Materials Hub and a Fellow of the RSC. He received his PhD in Physical Chemistry in 2001. After that, he took a JSPS fellow in Japan and senior research associate in Imperial College London. In 2009, he joined the Department of Chemical Engineering at University College London as a lecturer and then promoted to senior lecturer, reader and full professor. He currently leads a research team including postdoctoral researchers, academic visitors and research students with financial support from UK, EPSRC, Leverhulme, Royal Society, RAE, Newton Fund, EU PF7, Qatar and so on. His research has led to >110 papers with >7200 citations, 10 patents and many invited lectures over the last several years. He is the Editor-in-Chief of the Journal of Advanced Chemical Engineering, an Associate Editor of Asia-Pacific Journal of Chemical Engineering, an Editor of the Frontiers in Energy Research, the guest Editor-in-Chief of the International Journal of Photoenergy, 2012 and Associate Editor of Chin J. Catalysis apart from sitting on the editorial board of other international journals. He is the Vice President of the Chinese Society of Chemical Science and Technology in the UK, Honorary Lecturer at Imperial College London, Adjunct Professor in Nanjing Tech University and Chinese Academy of Sciences.

报告摘要

In parallel solar energy conversion and storage into a high density energy medium e.g H_2 via water splitting has thus been attracting substantial interest over the last decade, which can provide not only renewable H_2 fuel but also a carbon-zero economy. The key in this technology is an efficient photocatalyst. The current low efficiency in water splitting to H_2 fuel process is contributed to both fast charge recombination and large bandgap of an inorganic semiconductor, which will be first illustrated in the lectrue.

Stimulated by our recent research outcomes on the charge dynamics in inorganic semiconductor photocatalysts, we developed novel materials strategies for solar driven hydrogen synthesis by polymer photocatalysts. One is to mitigate the charge recombination by improving the degree of polymerization of a polymer e.g. C_3N_4. With respect to it, one successful example of pure water splitting in a suspensions solution under visible light has been demonstrated for the first time. The other strategy is to narrow the bandgap of carbon nitrides by bandgap engineering. The material prepared via an oxygen rich organic precursor has a dark color, resulting into an efficient H_2 production from water by UV and visible, even IR light with a quantum yield (QY) of 10% at 420 nm, which is the first example of a polymer photocatalyst working in such long wavelength for H_2 fuel production. The charge dynamics in these polymer photocatalysts were also systematically investigated. Finally a device composed this low cost polymer will demonstrate the efficiency of these strategies for solar to H_2 fuel synthesis.

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