Advanced Photocatalytic Materials for Solar water splitting

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The use of solar energy to drive the chemical and energy processes, along with the chemical storage of solar energy, are imperative for the transition to a low-carbon economy, sustainable and clean society. Solar hydrogen generation through water splitting processes has been developing as an important energy storage alternative. In this context, several approaches involving photocatalytic, photoelectrochemical (PEC) or, coupled photovoltaics, and electrolysis solutions have been widely studied.[1] Photocatalytic hydrogen production for transforming and storing inexhaustible solar energy to green and clean sustainable chemical energy (H_2) has been considered as an ideal way to relieve the growing global energy crisis. Although great achievements have been obtained, most of ~~the~~ photocatalysts still suffer unfavorable obstacles, such as weak photocatalytic stability, low efficiency, or toxicity, all of which critically restrict the practical application of photocatalysis technology. Therefore, developing appropriate photocatalysts that can overcome the above problems is always an essential strategy for the ultimate goal of high-efficiency photocatalytic H_2 and O_2 production. [2,3]

In this presentation, we discuss the use of advanced materials as photocatalysts for solar water splitting.

[1]Shwetharani, M. Sakar, C. A. N. Fernando, Vassilis Binas and R. Geetha Balakrishna, *Catalysis Science & Technology* (**2019**) 9, 12-46.
[2]Xing Kang, Jinwen Shi, Huaiyu Lu, Guiquan Zhang, Jiantao Yao, Lulu Hou, Feng Chen, Samuel S. Mao, Vassilios D. Binas, Shaohua Shen, *Advanced Sustainable Systems* (**2021**) 2100138
[3]S. Murcia-López, M. Moschogiannaki, V. Binas, T. Andreu, P-Y. Tang, J. Arbiol, J. Jacas, G. Kiriakidis, J.R. Morante, *ACS Applied Materials & Interfaces*, 9 (**2017**) 40290-40297.