



## Editorial for rare metals, special issue on photocatalysis

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Burning of fuels is an irreversible entropy increasing process, requiring additional energies derived from the environment to let the process cycle. In theory, photon energy delivered from the sun could fix the huge energy demand in a clean and sustainable way. Photocatalysis is such an ideal approach to reconvert inert molecules directly into fuels and other chemical feedstocks using photon energy without any other energy inputs.

This special issue contains thirteen original research articles focusing on the development of advanced photo(-electro)chemical nanomaterials for water splitting, CO<sub>2</sub> reduction and pollutant degradation. In the issue, we lay emphasis on the preparation of a series of novel nanostructures, such as core-shell TiO<sub>2</sub>/SrTiO<sub>3</sub> nanowire arrays, multilayered plasmonic nanofibers and 2D Sn<sub>2</sub>Ta<sub>2</sub>O<sub>7</sub> nanosheets, along with their structure-induced special photocatalytic properties. Beyond commonly used materials, the photocatalytic behavior of bifunctional metal-organic frameworks, for example, has also been investigated. Besides, in situ spectroscopy technologies are included to

reveal the intermediate reaction pathway of photocatalytic NO oxidation.

The next breakthrough of photocatalysis depends on several key aspects, including (1) the synthesis of new materials or structures with high photocatalytic activity; (2) the establishment of in situ analysis technologies with high time/spatial resolution; (3) the discovery of novel and important photocatalytic reactions, such as nitrogen fixation and methane activation. This journal will continue to provide opportunities for the publication of high-quality and high-impact papers in the research area of photocatalysis. We sincerely hope that the readers will enjoy the articles published in this special issue.



**Tie-Rui Zhang** is a full professor at the Technical Institute of Physics and Chemistry, Chinese Academy of Sciences and Director of Key Laboratory of Photochemical Conversion and Optoelectronic Materials CAS. He obtained his Ph.D. degree in Chemistry in 2003 at Jilin University (China). Subsequently, he worked as a post-doctoral researcher in the laboratories of Prof. Markus Antonietti, Prof. Charl F. J. Faul, Prof. Hicham Fenniri,

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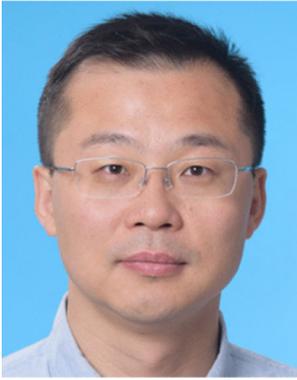
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**Yong-Fa Zhu** received his BA degree, Master degree and Ph.D. degree from Nanjing University, Peking University and Tsinghua University, respectively. He is a full professor of Tsinghua University and associate editor for *Applied Catalysis B*. His current research is focused on photocatalysis and application on environmental, energy conversion and anti-tumor. He is the author and co-author of 327 original research papers published in SCI journals. The total cited numbers reached about 21,800 and the H-index arrived at 80. About 34 papers were selected as ESI High-Cited Papers. Besides, he has written about 5 books and applied about 24 patents.