



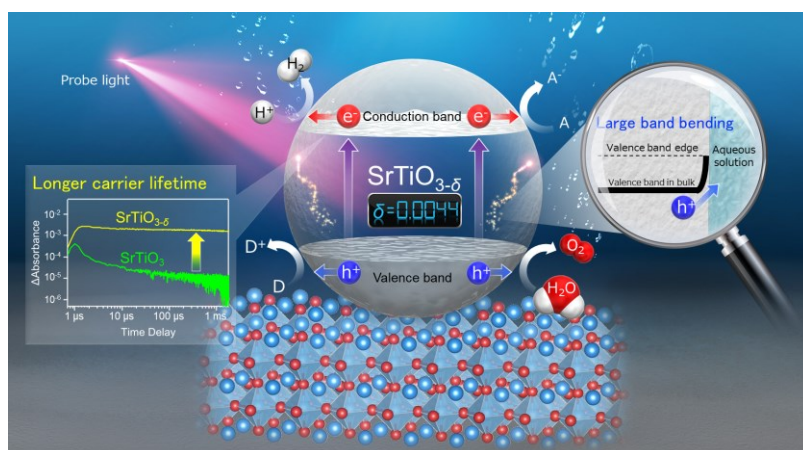
PRESS RELEASE (2018/07/02)

Electron doping improves photocatalytic activity for H₂ and O₂ evolution

Dr. Yoshihiro Yamazaki at Kyushu University (Q-PIT), Dr. Kazuhiko Maeda at the Tokyo Institute of Technology and collaborators have found that the electron doping into SrTiO₃ photocatalyst enlarges photocatalytic hydrogen and oxygen evolution reaction under UV light irradiation. The enhancement of hydrogen production was correlated well with an indication of prolonged lifetime of photoexcited electrons whereas that of oxygen evolution was due to the enlarged total flux of photoexcited holes towards the reaction site. These findings would lead to a new photocatalyst that could achieve higher efficiency in hydrogen production.

The article, entitled "[Homogeneous Electron Doping into Non-Stoichiometric Strontium Titanate Improves Its Photocatalytic Activity for Hydrogen and Oxygen Evolution](#)", is published in ACS Catalysis as a just accepted article on 2018/6/19 (Tue). The definitive article will be available soon.

The work was carried out in collaboration with Kyushu University (Q-PIT), Tokyo Institute of Technology, Toyota Technical Institute and the National Institute for Materials Science (NIMS).



(Figure) The lifetime of photoexcited electrons in electron-doped photocatalyst are significantly prolonged (left part in the figure). Electron doping, in addition, enlarges the surface band bending at solid-liquid interface (right part in the figure). Both significantly accelerate the photocatalytic H₂ and O₂ evolution reaction kinetics.

【Contact】

Yoshihiro Yamazaki, Professor
Kyushu University Platform of Inter-/Transdisciplinary Energy Research (Q-PIT)
INAMORI Frontier Research Center
Department of Materials Science and Engineering, Kyushu University
Tel : +81-92-802-6966 / Fax : +81-92-802-6967
Email : yamazaki@ifrc.kyushu-u.ac.jp

Kazuhiko Maeda, Associate Professor
Department of Chemistry, School of Science, Tokyo Institute of Technology
Tel: +81-3-5734-2239 Fax: +81-3-5734-2284
Email: maedak@chem.titech.ac.jp