

Title Efficient Solar Hydrogen Production by Tandem Cell System

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Place Lecture room No.9, Open Learning Plaza,
Ito campus, Kyushu University

Abstract

Solar hydrogen production, water splitting into hydrogen and oxygen by solar light just like photosynthetic process, is a very attractive research subject in terms of clean hydrogen energy production using renewable energy. There are some approaches to solar hydrogen production such as a combination system of photovoltaics and water electrolysis, a photoelectrochemical cell system and powder photocatalyst system. Among them, tandem cell system composed of transparent oxide semiconductor photoelectrode for oxygen production and dye-sensitized photoelectrode for hydrogen production is an efficient and cost-effective way for solar hydrogen production. It is possible to obtain about 5% solar to hydrogen energy conversion efficiency at this moment. In this presentation, our approach using TiO_2 , WO_3 and $\alpha\text{-Fe}_2\text{O}_3$ photoelectrodes as well as world trends in tandem-cell-driven solar hydrogen production will be introduced.

About the Speaker

Hironori Arakawa is professor of Department of Industrial Chemistry, Faculty of Engineering at Tokyo University of Science. He received his Doctor Degree from Tokyo Institute of Technology in 1976. After this, he joined National Chemical Laboratory, Japan. Then, he moved to Tokyo University of Science (TUS) in 2004. He was the first Dean at Graduate School of Chemical Sciences and Technology at TUS. His research is concerned with solar energy utilization such as solar hydrogen production, dye-sensitized solar cells and CO_2 hydrogenation. He received many awards such as Award of Japan Institute of Energy and The Best Paper Award of ISEC/ASME in USA. He is the author and co-author of over 280 peer-reviewed publications.

Host Professor Tatsumi ISHIHARA

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