

Department of Physics /
Institute of Computational and Theoretical Studies –
Adjunct Chair Professor Lecture

Photocatalysis of Metal Oxide Surfaces



Professor David SY TONG

- Academician of CAS
- Leading Professor,
South University of Science and Technology of China
- Director, Hefei National Laboratory of
Physical Sciences at the Microscale, USTC
- Published 6 books and over 260 research papers
(in Science, Advances in Physics, Physics Today ,
Progress in Surface Science, Proceedings of
National Academy of Sciences, Physical Review Letters, etc.)

Date: 2 November 2012 (Friday) Time: 5:00 p.m. – 6:00 p.m.
Venue: Lecture Theatre WLB 205, Wing Lung Bank Building
Shaw Campus, HKBU, Kowloon Tong

Abstract. Metal oxide surfaces have been shown to be effective in photocatalytic reactions such as water splitting, chemical pollutant (dye) degradation and antibacterial action. An unanswered question is, while a few metal oxide surfaces, e.g. ZnO, α -TiO₂(101) and r-TiO₂(110) can kill bacteria, decompose dye or pollutant molecules under light with various wavelengths, other oxide surfaces, e.g. SnO₂(110) or In₂O₃(110), are photo-catalytically inactive. As photocatalysis involves the absorption of light and creation of electron-hole pairs, a metal oxide surface needs to be a *good* semiconductor in order to be photo-active. However, because general applications of photocatalysis occur under ambient conditions, how can a metal oxide surface remain a *good* semiconductor after reactions with ambient gases (e.g. O₂, N₂, H₂O, etc.)?

In this talk, we shall explore these issues and provide data that show ambient gases form protective coatings on some metal oxide surfaces, thus generating “passivated semiconductors” in air. This is nature’s way of surface pacification and these adsorbed molecules effectively protect the surface from adsorption of other ambient gases. By contrast, protective coatings do not form on the majority of metal oxide surfaces and their surfaces become poor semiconductors, giving up all hope of them being effective photo-catalysts.

The lecture will be conducted in English.
Contact person: 3411 2760 (Miss Yau)
E-mail: icts@hkbu.edu.hk

ALL are welcome to attend this lecture.
Seats are LIMITED!
Please register to ensure seating.