第371回触媒化学研究センターコロキウム

Charge-carrier Dynamics in Photocatalytic Processes

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Seminar Room A, Sousei Hall, Hokkaido University

（創成科学研究棟4階セミナー室A）

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The activity of photocatalytic compounds is related to the creation and the evolution of charge-carriers in the photocatalyst. Thus, the knowledge of the relation existing between charge-carrier lifetimes and material structural parameters can help to understand the mechanisms leading to the photoactivity. To follow the charge-carrier dynamics in the photocatalyst, the variation of the sample conductivity after illumination must be determined. The Time Resolved Microwave Conductivity (TRMC), a contactless method based on the measurement of the change of the microwave power reflected by a sample induced by laser pulsed illumination, allows to follow directly, on a nano-time scale, the decay of the number of electrons and holes after the laser pulse by recombination or trapping. In this work, different photocatalytic materials and devices have been studied. The influence of charge-carrier dynamics on photocatalytic mechanisms has been evidenced by TRMC. Photocatalytic devices using monophasic and biphasic TiO2 powders (anatase, rutile and brookite) synthetized using various methods (hydrolysis, thermohydrolysis, hydrothermal, microwave), Bi2WO6 visible-light photocatalyst, supported Keggin heteropolyacid H3PW12O40 (POM), commercial TiO2 for Cr(IV) reduction will be presented.

問合せ先： Professor Bunsho OHTANI（ohtani@cat.hokudai.ac.jp/011-706-9132）

1996: Ph. D. Thesis in Physical-Chemistry of Materials, UMPC, Paris, France, 1997-98: Post-doctoral position at Helmholtz-Zentrum Berlin, Germany, 1998-2008: Assistant Professor at Universite Paris 13, Villetaneuse, France and 2008-: Professor at Universite Paris-Sud, Orsay, France. Interests: (1) The elaboration of photocatalytic nanomaterials (surface treatment by metal nanoparticles), (2) The study of photocatalytic mechanisms (Time Resolved Microwave Conductivity) and (3) The setup of wastewater treatment reactors (batch and annular reactors).