

## PHOTOPROCESSES ON SEMICONDUCTOR SURFACES

T. INOUE

DEPARTMENT OF ELECTRICAL ENGINEERING  
TOKYO METROPOLITAN TECHNICAL COLLEGE  
1-10-40 HIGASHI-OOI, SINAGAWA-KU, TOKYO 140, JAPAN.

Light-excitation of an interface of semiconductor-electrolyte junction induces a variety of phenomena with charge transfer processes of photoproduced carriers across the junction. In a lecture, the principal aspect of the phenomena of semiconductors will be presented as well as some applications, focusing on photoinduced chemical transformation on the semiconductor surfaces.

## 1) photoelectrolysis of water over semiconductor.

Semiconductors such as  $\text{TiO}_2$ ,  $\text{MTiO}_3$ , GaP, SiC were used as photoelectrodes of water splitting. Electrolytic characteristics were discussed on the efficiency using parameters of  $E_g$  and  $E_{fb}$ .

## 2) photocatalytic process of semiconductors.

Semiconductor catalyst was developed as a local micro-cell. Photoreduction of water and carbon dioxide were carried out and summarized with respect to photoprocess of semiconductor surface.

## 3) photofabrication of semiconductor surfaces.

Photoelectrochemical deposition process was introduced to a photocell fabrication of  $\text{CdS}/\text{Cu}_2\text{S}$ . Fabrication treatment and cell property were discussed.

## 4) photoelectrochemical imaging processes.

Colored chemicals were photodeposited as an image on semiconductor surface. This light-writing imaging process was performed via a reversible photoprocess of semiconductor. Characteristics were discussed from viewpoint of semiconductor photoprocess.