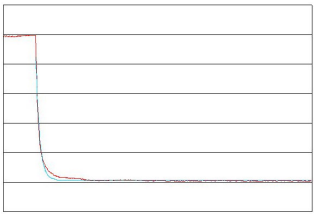
Electron lifetime and diffusion measurement System

PSL-100

for Dye-sensitized Solar Cell (DSC)
using Stepped Light-Induced transient Measurement of PhotoCurrent and Voltage

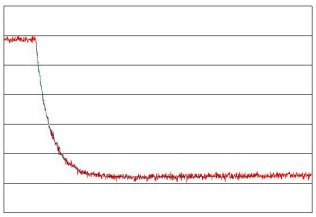
Materials for DSC (Dye-sensitized Solar Cell) have been evaluated with assembled DSCs. To improve the evaluation process, the measurement of electron-transfer condition will give the designing guide line for DSC developments. The PSL-100 is designed to measure electron diffusion coefficient (D), lifetime (τ) and diffusion-length ($L=\sqrt{D\tau}$) by using Stepped Light-Induced transient Measurement of PhotoCurrent and Voltage. To increasing Isc and Voc of DSC, it is necessary to investigate materials and improve manufacturing processes. Evaluation of DSC using the results from the PSL-100, electron diffusion coefficient and lifetime, gives more efficient R&D of DSC.

Examples of measurements



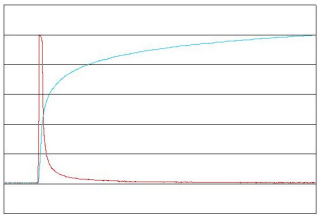
Electron diffusion coefficient

Electron mobility on TiO_2



Electron life time

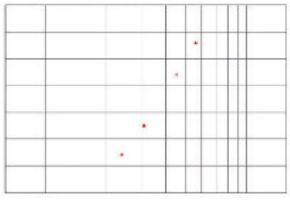
The time from electron generation to recombination



Electron density

Electron carriers inside of DSC

Data summary



1) Electron diffusion coefficient vs Isc
2) Electron life time vs Isc
3) Electron density vs Electron life time
4) Electron density vs Voc

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