

## 염료감응 태양전지내의 입자크기에 따른 산란효과

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### Scattering Particle Size Effects on the Dye-sensitized Solar Cell Efficiency

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**Key words** : Dye-sensitized solar cells; Scattering efficiency; Particle size; Rutile; Anatase; Reflectivity

**Abstract** : Scattering particle size effects on the dye-sensitized solar cell efficiency has been investigated with a FTO/semitransparent nano-TiO<sub>2</sub> layer (main-layer)/scattering layer (overlayer) structure. Two different size of rutile TiO<sub>2</sub> particles (0.3  $\mu\text{m}$  (G1) and 0.5  $\mu\text{m}$  (G2)) were used to investigate the scattering effect. The conversion efficiency of 7.55% for the 7  $\mu\text{m}$ -thick main-layer film without scattering layer was improved to 8.94% and 8.78% when G1 and G2 particulate overlayers were introduced, respectively, corresponding to 18.4% and 16.3% increments. Whereas, the conversion efficiency of the 14  $\mu\text{m}$ -thick main-layer was slightly improved from 8.60% to 9.09% and 9.15% upon depositing G1 and G2 particulate overlayers, respectively. Significant improvement and strong size-dependence upon deposition of scattering overlayer on the relatively thinner TiO<sub>2</sub> main-layer film is ascribed to the quantity and wavelength of transmitted light and the difference in reflectivity of G1 and G2 scattering particles.

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