

## Fabrication of Mesoporous Inverse Opal $\text{TiO}_2$ Film for Light Scattering Layer in Dye-Sensitized Solar Cell

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Dye-sensitized solar cell, one of the most attractive energy sources to alternate fossil fuel, is improved its light conversion efficiency by various method for several years. Among these improvements, concentration of light by scattering layer is much effective. Inverse opal  $\text{TiO}_2$  electrodes which are synthesized by self-assembled using sphere materials such as PMMA, Polystyrene and Silica Spheres lead to higher light harvesting efficiency. The inverse opal  $\text{TiO}_2$  electrodes caused a significant change in dye absorbance which depended on the position of the stop band 200nm to 600nm has been considered due to their photonic crystal and light scattering effect. However, these inverse opal  $\text{TiO}_2$  electrodes have a crucial problem for DSSC system because of insufficient adsorption amount of dye due to their low surface area.

In this study, we synthesized mesoporous inverse opal  $\text{TiO}_2$  electrodes to increase their surface area for abundant dye adsorption. Photo-conversion efficiency of DSSC with mesoporous inverse opal  $\text{TiO}_2$  electrode as a scattering layer has increased compared to that of inverse opal  $\text{TiO}_2$  electrode DSSC.