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Novel Fabrication of Platinum Counter Electrode in Dye-sensitized Solar Cells Using Nano-second Pulsed Laser Sintering

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The counter electrodes in dye-sensitized solar cells (DSSCs) play roles in not only collecting electrons from external circuit but also reducing I₃⁻ to I⁻ in electrolytes. Generally, conventional counter electrodes for DSSCs are prepared from the high temperature treatment of the H₂PtCl₆ precursor solution at 400°C. However, the more simplified fabrication process of counter electrodes is required for the commercialization of DSSCs. In this work, we developed novel fabrication process of counter electrodes using nano-second pulsed laser. DSSCs employing counter electrodes prepared by laser process showed conversion efficiency of 6.75% with short-circuit current of 12.73 mA/cm², open-circuit voltage of 0.74 V and fill factor of 0.72. Closer investigating of photovoltaic properties will be reported.

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