

Electrochemical Properties of Activated Carbon Counter Electrode for Dye-Sensitized Solar Cells

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A new carbon electrode was made based on an activated carbon (AC) using TiO_2 binder and compared with a Pt sputtered electrode as the counter electrode of dye-sensitized solar cells. Cyclic voltammetry(CV) and AC impedance spectroscopy were used to investigate electrochemical properties of both AC electrode and Pt electrode. The photocurrent-voltage characteristics were influenced by both the roughness factor and the electrical resistance of the carbon counter electrode. The voltage of the carbon electrode-based DSSC increased by about 50 mV using the carbon counter electrode compared to the Pt counter electrode because of positive shift of the formal potential for iodide/triiodide redox couple. The AC counter electrode has the merit of improving the fill factor and conversion efficiency of DSSC by reducing its internal resistance.

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