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Cassava root materials composited with PEDOT:PSS used as low cost counter electrodes in dye-sensitized solar cells

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A composite film of Cassava root and Poly (3,4-ethylenedioxy thiophene)-polystyrene sulfonate (C/PEDOT:PSS) was prepared as a high electrocatalytic material for the counter electrode (CE) of a dye-sensitized solar cell (DSSC). The effect of sintered of Cassava root under Ar atmosphere at 1000 °C was intended for increasing the conductivity, and the PEDOT:PSS was used for a strong adhesion of the composite film to the FTO-Glass substrate. The DSSC with the C/PEDOT:PSS composite CE exhibited a high energy conversion efficiency (η) of 9.54% under full sunlight illumination condition of 100 mW/cm², comparable to that of the DSSC based on the Pt electrode (10.03%). The composite catalytic film of C/PEDOT:PSS is a low-cost alternative for replacing the conventional and expensive Pt film.

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