

Photoelectrochemical solar cells based on SnO₂ nanocrystalline films

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Abstract: Dye-sensitized solar cells (DSSCs) fabricated using nanocrystalline SnO₂ films sensitized by the Ru(dcbpy)(NCS)₂ dye (N3) were compared to the corresponding nanocrystalline titania cells. Although the light-to-power energy conversion efficiency of SnO₂ cells is low with respect to the nc-TiO₂ DSSCs, their general characteristics are similar. The influence of the addition of 4-tert-butylpyridine (4TBP) or acetic acid to the electrolyte was investigated. 4TBP increased the cell's open-circuit voltage and stability. Raman spectroscopy confirmed the presence of new vibration bands; their intensity depends on the additives and characterizes the amount of tri-iodides at the photoactive interface, as well the complex formed between dye and iodide. To cite this article: N. Nang Dinh et al., C. R. Chimie 9 (2006). © 2005 Académie des sciences. **Author Keywords:** DSSC; Dye-sensitized solar cells; N3; Photoelectrochemical efficiency; Raman spectroscopy; SnO₂

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