



CoffeeTalk@ISOF

EXTENDED EDITION

Water based sensitized solar celles

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Dye-sensitized solar cells (DSSC) have attracted much attention due to their relatively low cost, acceptable conversion efficiency and ease of fabrication. Most of the research on DSSC focused on organic solvent-based electrolytes employing the widely used I^-/I_3^- redox couple. Here, we report on a new water soluble and stable thiolate/disulfide redox couple (T⁻/DS) and its use with a new zwitterionic and thiocyanate-free dye (**T169**) in a 100% aqueous electrolyte system. A DSSC incorporating **T169** and the T⁻/DS showed the highest photocurrents ($J_{sc} = 13.30 \text{ mAcm}^{-2}$) and IPCE% (84%) values reported to date. In addition, a 2000 h long-term stability measurement was performed, where J_{sc} and V_{oc} of the above mentioned DSSC stayed somehow the same except for the fill factor (FF) which decreased from 0.62 to 0.48 and consequently lowered the total efficiency (from $\eta = 4.5\%$ on day 1 to $\eta = 3.3\%$ after 2000 h).

My research is multidisciplinary, focusing on the relationship between structure and photochemistry in novel compounds and materials (organic and inorganic). I am a Physical Organic/Inorganic Chemist by training specialized in the area of photo-induced charge transfer (CT) reactions. What unifies a large part of my past and present research interests is the elucidation of the factors that affect electron and energy transfer reactions in different synthetic scaffolds at heterogeneous interfaces and nanostructures. The issues I address are of the basic science type, and the ultimate goal is to devise photo-to-current systems that are efficient, stable and ecofriendly. Another recent research area that I am involved in is the identification, derivatization and synthesis of bio-active material that are potential anti-tumor drugs.

Thursday, 9 February 2017, 14:30

ISOF 12 – Meeting Room (1st floor)

CNR Research Area

Via Gobetti 101, Bologna



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