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# Coadsorption of spectrally complimentary dyes in solid-state dye-sensitised solar cells: Observation of inter-dye energy transfer and enhanced photo-conversion efficiency

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Combining nanostructured oxides with photoactive organic semiconducors can lead to the creation of efficient solar cells. However, light capture in these “hybrid” organic-inorganic solar cells requires further improvement in order to enhance light harvesting and power conversion efficiency towards commercially realistic values [1,2].

Here, in order to enhance the spectral band-width of the solar cell, we have employed muliple-sensitizers spectrally complementary absorption bands. Further to increasing the overall light harvesting and current generation efficiency, we have observe inter-dye energy transfer from the higher energy to lower energy dye’s. This unique charge generation mechnism proves to be remarkably efficient.

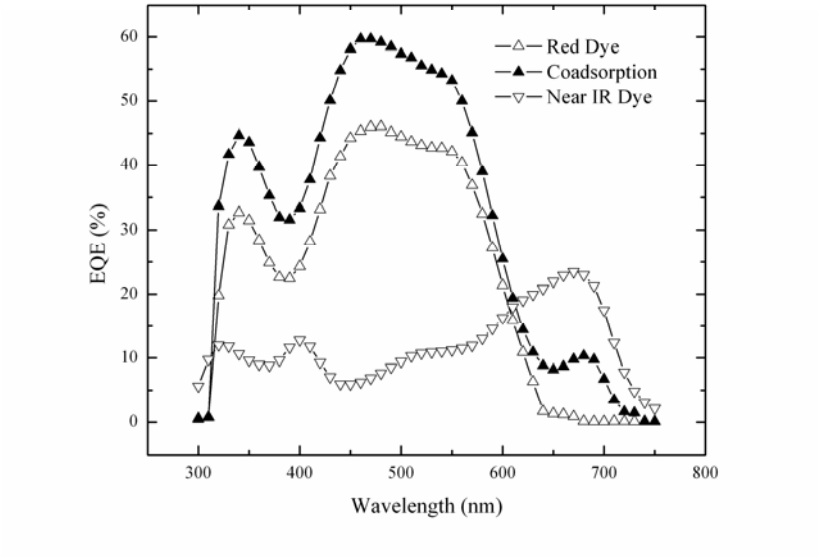


**Figure 1:** Spectral response of solid-state dye-sensitized solar cells which have been fabricated using a red dye, a near IR dye and a coadsorption of both dyes. The response shows an extension of the spectral range for the coadsorbed cells as well as an enhancement of the visible spectrum.

**References**

[1] B. P. Rand, P. Peumans and S. R. Forrest; J. Appl. Phys., Vol 96, No 12, p.7519 (2004)
[2] M. Westphalen et al. Solar Energy Materials & Solar Cells, 61, 97-105 (2000)