

# A solar cell sensitized with three different dyes

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## Abstract

Construction of a semiconductor—dye heterostructure of the configuration  $n\text{-TiO}_2/\text{D}_1/p\text{-CuSCN}/\text{D}_2/p\text{-CuSCN}/\text{D}_3/p\text{-CuSCN}$  ( $n\text{-TiO}_2$  is the nanocrystalline  $\text{TiO}_2$  film deposited on conducting glass,  $p\text{-CuSCN}$  = ultra-thin ( $\sim 2$  nm) layers of Cu(I) thiocyanate,  $p\text{-CuSCN}$  = thick layer of  $p\text{-CuSCN}$ ,  $\text{D}_1$  = Fast Green,  $\text{D}_2$  = Rhodamine 6G and  $\text{D}_3$  = Acridine Yellow) is described. It is found that this heterojunction generates photovoltaic response to light absorption by all the three dyes. The mechanism involved is suggested to be transfer of electrons to  $n\text{-TiO}_2$  and holes to  $p\text{-CuSCN}$  via tunneling. This technique could be a strategy to broaden the spectral response and enhance the efficiency of dye-sensitized solar cells.

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