

## A Dye-sensitized Photocatalyst (p-Type CuCNS) for the Generation of Oxygen from Aqueous Persulphate

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p-CuCNS coated with Rhodamine B and then photoplatinized is found to photogenerate oxygen from aqueous persulphate with the dye remaining photostable. The photochemical mechanisms involved are discussed.

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Dye-sensitization has attracted much attention as a means of extending the spectral response of semiconductor electrodes and catalysts based on high-band-gap materials.<sup>1-9</sup> However, dye-sensitized systems suffer from three major defects. (1) Although the semiconductor remain stable, the dyes undergo photodegeneration. (2) The dye has to be kept firmly affixed to the surface, as only the dye molecules adsorbed at the semiconductor are effective in photoinduced charge transfer. (3) Concentration quenching limits the quantum efficiency. These problems become more critical in a sensitized-particle system,<sup>6-9</sup> and few hydrogen-photogenerating systems based on this approach have been demonstrated.<sup>7-9</sup> Oxygen photogeneration from dye-sensitized systems is more difficult, as the dyes are very susceptible to oxidative degradation. We have found that p-CuCNS coated with Rhodamine B (RH) and then platinized (CuCNS/RH/Pt) acts as a stable catalyst for visible-light photodecomposition of aqueous persulphate.

**Experimental**