

Functionalized nanostructured electrode materials for photoelectrochemical devices

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W-501 seminar room, 5F WPI/MANA Bldg., Namiki site



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Abstract

Functionalization of metal oxide semi-conductors (p-type or n-type) with sensitizers like molecular dyes or transition metal clusters is a topic of growing interest because of its potential application in the development of a new type of photoelectrochemical devices, and particularly the fabrication of dye-sensitized solar cells (DSSCs) or photoelectrocatalytic systems for solar fuel production. The use of nanomaterials having suitable optoelectronic properties is necessary to improve the efficiency of these promising low-cost devices. Especially, the matching between the energy levels of the semiconductor and that of the sensitizer is revealed a crucial point to permit a good charge transfer through the electrode. After introducing the challenge of the optimization of these photoelectrodes, I will focused my presentation on the choice of the semiconductor and strategies to tune their optoelectronic properties.