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Synthesis and characterization of novel semiconductor nanocrystals for third generation solar cells

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Abstract content
   (Max 300 words)

Semiconductor nanocrystals are attractive materials for use in photovoltaic devices mainly as a result of their tuneable absorption spectrum, large surface area (because of their small size), their adaptability, their ability to generate multiple excitons as well as their capability of hot carrier injection from excited state i.e. by minimizing energy losses during the thermalization of excited state. Semiconductor nanocrystal solar cells are projected to achieve higher efficiencies than silicon based solar cells while reducing the cost of (1) each kilowatt of electricity produced, (2) the raw materials and (3) the processes used to convert the raw materials into functional cells. Semiconductor nanocrystals in solar cells are very versatile and can be used in various types of photovoltaic cells, such as metal junction solar cells, hybrid solar cells, infrared solar cells, multi-exciton generating solar cells, quantum dot dye sensitized solar cells, rainbow solar cells, intermediate band solar cells, and luminescent solar cells. Herein novel synthesis and characterization of various types of semiconductor nanocrystals is reported. Their properties and relevance to application in photovoltaics is discussed.

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