Quantum-Dot Solar Cells

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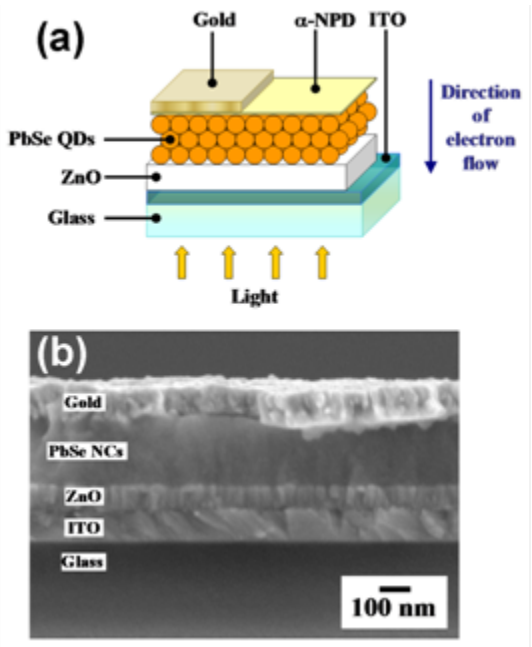
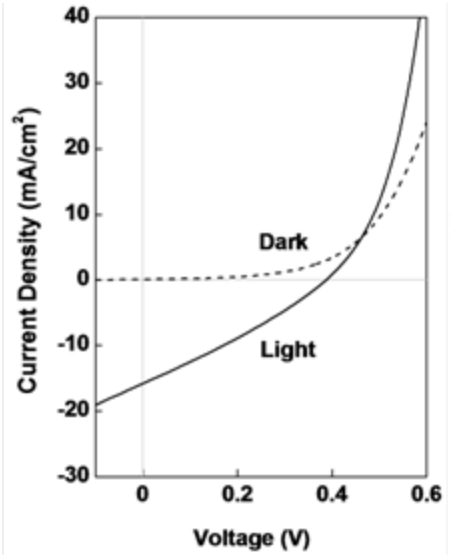
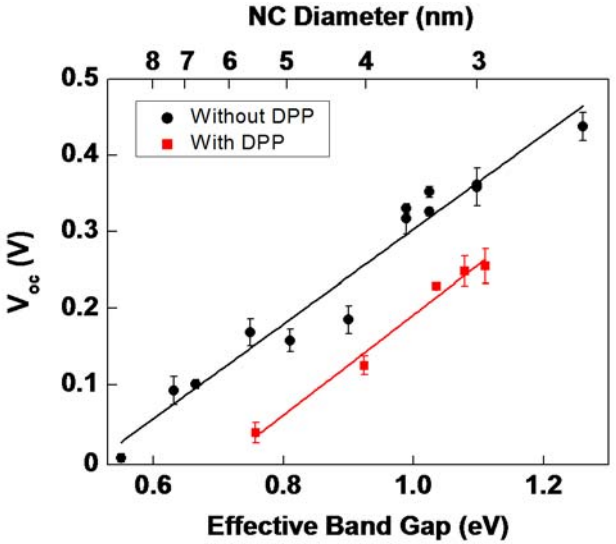
- DESCRIPTION OF WORK
  - Unique optical and electronic and properties of quantum dots (QDs) can be advantageous for solar cells
  - We are exploring various solar cells architectures to exploit these unique properties.



- MAJOR ACHIEVEMENTS & OBSERVATIONS
  - Demonstrated a new type of solar cell based on heterojunctions between PbSe QDs and ZnO thin films.
  - Solar cell photovoltage depends on the size of the QDs.
  - With 100 mW/cm^2 illumination these solar cells exhibit short circuit currents between 12 and 15 mA/cm^2, open-circuit voltages up to 0.45 V, and a power conversion efficiencies of up to 1.6%.





- Publications
  - K. S. Leschkies, T. J. Beatty, M. S. Kang, D. J. Norris, and E. S. Aydil, *ACS Nano* **11**, 3638-3648 (2009).
  - Acknowledgements: NSF-NIRT program (CBET-0506672), NSF REU program (DMR-0754792) & NSF MRSEC (DMR-0212302)

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