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Colorado State University

Inorganic Shells for CZTS Nanocrystals With Enhanced Charge Transport Capabilities

Researchers in the Chemistry department at Colorado State University are developing a novel method of encasing nanocrystals in an inorganic shell that will improve charge transport and increase the surface stability of the nanocrystals. This shell technology will have the ability to make nanocrystal solar photovoltaic cells comparable to bulk thin material cells. The shell controls the nanocrystals' packing order, proximity, and surface chemistry to optimize the nanocrystals' electrical properties. Specifically, the shells allow charge-carrying electrons to travel efficiently between nanocrystals, as well as preventing nanocrystal oxidation and reducing trapped states. The shells serve as an alternative to the high-temperature annealing process, thus reducing the production costs for nanocrystal solar photovoltaic cells.

This technology is especially promising to manufacturers of solar photovoltaic cells, as they can produce cells that are far more efficient and cheaper than current cells. The inorganic elements comprising the shells ensure the nanocrystals they encase are resistant to degradation from exposure to air.

Contact us for more information regarding this exciting technology.

Patent Information
U. S. and Foreign Patent Rights Available

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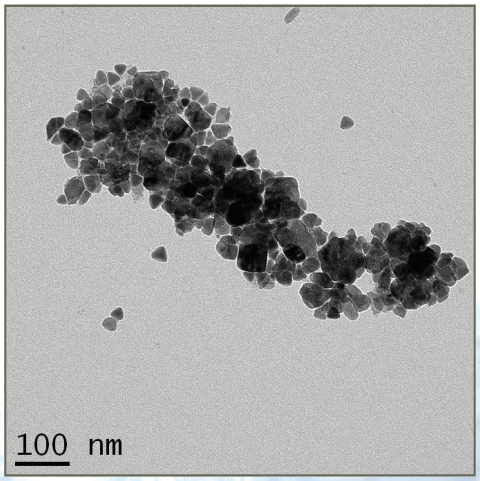

Features and Benefits

- Enhances charge transport in nanocrystal solar cells
- Increases nanocrystal surface stability in presence of air
- Eliminates need for expensive annealing process
- Reduces trapped electron states to facilitate charge transport

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