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A Study Of CdSe/ZnS Core-Shell Quantum Dots For Use in Luminescent Solar Concentrators MEREDITH HYLDAHL, SHELDON BAILEY, PAUL FONTECCHIO, BRUCE WITTMERSHAUS, Pennsylvania State University, Erie — A Luminescent Solar Concentrator (LSC) is a translucent plate that uses embedded fluorescent materials to absorb sunlight. The fluorescence that is produced is then transferred to the edges of the plate via total internal reflection where it is absorbed by photovoltaic cells. We compare a LSC made of CdSe/ZnS core-shell quantum dots (QD) (Evident Technologies) embedded in a transparent epoxy to a LSC made with the fluorescent organic dye Lumogen Red (BASF) cast in a thin polymer film. Fluorescence and absorption spectra and edge light output measurements are reported in this study. The Lumogen Red LSC outperforms the QD LSC suggesting a lower fluorescence quantum yield for the QDs. QDs are also easily oxidized, whereas the Lumogen Red dye is relatively more stable in the presence of oxygen. The merits of QDs as a fluorescent material for a LSC are discussed in terms of light output, photostability, and cost.

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