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Tunability and Stability of Lead Sulfide Quantum Dots in Ferritin[1] J. RYAN PETERSON, KAMERON HANSEN, Brigham Young Univ - Provo — Quantum dot solar cells have become one of the fastest growing solar cell technologies to date, and lead sulfide has proven to be an efficient absorber. However, one of the primary concerns in dye-sensitized quantum dot solar cell development is core degradation. We have synthesized lead sulfide quantum dots inside of the spherical protein ferritin in order to protect them from photocorrosion. We have studied the band gaps of these quantum dots and found them to be widely tunable inside ferritin just as they are outside the protein shell. In addition, we have examined their stability by measuring changes in photoluminescence as they are exposed to light over minutes and hours and found that the ferritin-enclosed PbS quantum dots have significantly better resistance to photocorrosion.

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