

Sensitizing triplet photochemistry using colloidal quantum dots*Kaifeng Wu*

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In recent years, sensitization of molecular triplets using inorganic semiconductor nanocrystals or quantum dots (QDs) *via* triplet energy transfer (TET) has emerged as a new area with potential applications ranging from photochemical photon upconversion to organic synthesis. We investigated the fundamental mechanisms of the inorganic/organic TET by building well-defined model systems and applying state-of-the-art time-resolved spectroscopy tools. In doing so, we uncovered the essential role of quantum confinement of nanocrystals in facilitating electronic coupling required for triplet energy transfer. We also established a unified picture of charge-transfer-mediated triplet energy transfer mechanisms, which greatly expanded the scope of molecular triplet sensitization using nanocrystals.