

Abstract Submitted  
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**Singlet and Triplet Exciton Harvesting in the Thin Films of Colloidal Quantum Dots Interfacing Phosphorescent Small Organic Molecules** BURAK GUZELTURK, PEDRO LUDWIG HERNANDEZ-MARTINEZ, Nanyang Technological University, Bilkent University, DEWEI ZHAO, XIAO WEI SUN, Nanyang Technological University, HILMI VOLKAN DEMIR, Nanyang Technological University, Bilkent University — Efficient nonradiative energy transfer is reported in an inorganic/organic thin film consists of a CdSe/ZnS colloidal quantum dot (QD) layer interfaced with a phosphorescent small organic molecule (FIrpic) codoped fluorescent host (TCTA) layer. The nonradiative energy transfer in these films has a cascaded energy transfer behaviour: first from the fluorescent host TCTA to phosphorescent FIrpic and then to QDs. The nonradiative energy transfer in these films enables very efficient singlet and triplet state harvesting by the QDs with a fluorescence enhancement factor of 2.5-fold, while overall nonradiative energy transfer efficiency is over 90%. The experimental results are nicely supported by the theoretical model which includes exciton diffusion assisted Förster-type near-field dipole–dipole coupling within the films.

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