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Light Harvesting in Nanoscale Systems

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Here, we will discuss the current status of challenging light harvesting nanomaterials such as semiconducting quantum dots (QDs), metal nanoparticles, semiconductor-metal heterostructures, π-conjugated semiconductor nanoparticles, organic-inorganic heterostructures, and porphyrin based nanostructures.[1-7] The fundamental knowledge of these photophysical processes is crucial for the development of efficient light harvesting systems like, photocatalytic, and photovoltaic. We will highlight the impacts of size, shape and composition of QDs on exciton decay dynamics and the energy transfer process for developing light harvesting systems. Potential light harvesting systems based on hybrid π-conjugated semiconductor polymer nanoparticles, and self assembled structures of π-conjugated polymer will be discussed. We also discuss the significance of porphyrin based nanostructures for potential light harvesting systems.

References

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