

Silica Encapsulation of InP/ZnSe/ZnS QDs via Modified Stöber Method for Stability Enhancement

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Semiconductor quantum dots (QDs) have been widely researched for light emitting application due to their tunable emission and high color purity. Among various QDs, Cd-free QDs, such as InP QDs, have attracted much attention for their low toxicity and comparable optical properties with CdSe QDs. However, InP based core/shell QDs usually shows poor long-term stability against oxygen and humidity compared with Cd chalcogenide core/shell materials. Therefore, there should be additional surface stabilization process to make InP QDs be much interesting. In this study, we present a modified Stöber method to coat the highly emissive InP/ZnSe/ZnS QDs with silica shell. The silica shell serve as a protective layer to prevent the diffusion of oxygen to the surface of the QDs and thus enhance the stability.