

New synthetic pathway of InP quantum dots utilizing triphenyl phosphite

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Colloidal InP nanocrystals (NCs) have been attracted a huge interest as a potential alternative to CdSe-based NCs, because of their non-toxic property and tunable emission bandwidth throughout all visible range. One of the most important issues on designing InP NCs stems from the lack of good phosphorus precursors due to some drawbacks on their cost, safety, or reactivity. For instance, tris(trimethylsilyl)phosphine ((TMS)₃P) as well-known phosphorus precursors for InP synthesis, is extremely reactive and expensive chemical which contains huge potential danger in large-scale synthesis. In this work, the InP NCs synthetic method using safer and cheaper precursor is introduced. The method is based on the original colloidal method except reacting InCl₃-OLA as indium source with triphenyl phosphite to form In-P monomers. With using ZnCl₂ as growth kinetics manager, resultant InP NCs shows 1s peak from blue-green to red region. While the noticeable photoluminescence (PL) was not observed, adequate shelling process would recover surface defects to exerts high quality as light emitter.