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Special Issue on

Frontier Researches on Heavy Metal-Free Colloidal Semiconductor Quantum Dots

CALL FOR PAPERS

In the past decade, colloidal semiconductor quantum dots have attracted enormous attentions in various research fields. As ultrasmall nanocrystals with pronounced quantum confinement, they exhibited size-tunable optical band gaps and superior absorption coefficient and enhanced photoluminescence compared to the bulk materials, which can be utilized in solar cells, light emitting diodes, photodetectors, biomarkers, and so forth. However, conventional semiconductor quantum dots all contain heavy metal elements (Cd, Te, and Pb) hazard to human bodies preventing them from realistic wide-spread usage.

Recently, nonheavy metal semiconductor quantum dots have started to be investigated showing great potential as "green" alternatives to traditional quantum dots materials. For example, CuInS or ZnCuInS quantum dots can be promising candidates in solar cell and LED application. Carbon quantum dots also exhibited superior optical and biological properties in biosensors, emitters, and so forth. Further, work on invention or improvement of such materials is therefore highly necessary and worthwhile.

We invite investigators to contribute original research articles as well as review articles covering all aspects in the research of heavy metal-free quantum dots which will help to optimize the synthesis methods, improve the understanding of fundamental properties, and provide reference for application.

Potential topics include, but are not limited to:

- Synthesis and characterization of nonheavy metal quantum dots
- Optoelectric properties, photochemistry, and photophysics of nonheavy metal quantum dots
- Application in optoelectric devices (solar cells, LEDs, and photodetectors)
- Latest advances in photocatalytic application
- Nonheavy metal quantum dots as biodetectors and biomarkers

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