## عنوان مقاله:

Surface chemistry of as synthesized and amine exchanged colloidal PbS quantum dots

## محل انتشار:

دهمین همایش مشترک و پنجمین کنفرانس بین المللی انجمن مهندسی مواد و متالورژی و انجمن علمی ریخته گری ایران (سال: ۱۳۹۵)

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## خلاصه مقاله:

PbS nanoparticles were synthesized in this study through hot injection process and optical properties as well as their quantum confinement were investigated. The results of UV-Vis-NIR spectroscopy analyses and transmission electron microscopy (TEM) showed that synthesized nanoparticles with dimensions of ۲.۳ to ۴.۲ nm had absorption peaks between ۷۶۸ to ۹۷۳ nm. As synthesized PbS QDs were capped with oleic acid (OA) ligands and kept as stable colloids in argon atmosphere. The effects of three steps were investigated on the optical properties and subsequent oxidation of PbS QDs; ligand exchange to ethyl amine (EA), changing the storage conditions from argon to air atmosphere, and colloidal to solid film transformation. Surface chemistry investigations by the means of NMR, FTIR, XRD and XPS indicated that variations on the optical properties of PbS quantum dots is related to oxygen absorption on the surface of QDs and preparation of PbSO۳ and PbO oxides on their surfaces

## کلمات کلیدی:

Quantum dot, Infrared absorption, Oxidation, Thin film, Ligand exchange