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LEAD IODIDE CRYSTAL SYNTHESIS FOR SINGLE CRYSTAL CONVERSION STUDIES TO LEAD PEROVSKITES

Craig Laing

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We report the synthesis of lead iodide crystals of various sizes grown via solution-phase colloidal chemistry. Different solvent systems were investigated using different surfactants and reaction conditions to develop a lead iodide crystal synthesis for use in single crystal conversion studies to lead perovskites. Different solvent systems involving ethylene glycol (EG) and either isopropanol or 1,4-butanediol were used to precipitate microcrystals of lead iodide from lead nitrate and potassium iodide. Polyvinylpyrrolidone and hexadecyltrimethylammonium bromide were used as a surfactant in an attempt to control the size of the particle in an effort to produce nanoparticles of lead iodide. The conditions of the lead iodide microcrystal synthesis were optimized to produce more uniform crystals of the smallest possible size. These crystals were then transformed to lead perovskite and this transformation was studied using various characterization techniques.