

Abstract Submitted
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Synthesis of Large Single Crystals of LaMnPO¹ GREG SMITH, JACK SIMONSON, CARLOS MARQUES, Stony Brook University, VICTOR LEYVA, Rice University, MEIGAN ARONSON, Stony Brook University — The compound LaMnPO is isostructural with LaFeAsO, a recently discovered high-temperature superconductor, but optical spectroscopy and transport measurements of this compound have been heretofore limited by small crystal size. Accordingly, crystal syntheses from Sn, Pb and molten salt fluxes (including NaCl/KCl, LiCl/NaCl, KCl, CaCl₂, BaCl₂/CaCl₂ and KCl/CaCl₂) were investigated. Fluorine doping was explored; concentrations less than 30 at.% (nominal) had no effect on crystal size; concentrations greater than 40 at.% (nominal) did not yield crystals. Once growth parameters were optimized, the crystals grew in a flat rectangular shape with black luster; their composition was verified with powder and single crystal x-ray diffraction. Successful growths yielded crystals with dimensions up to 3.2 mm by 1 mm by 10 μ m, a significant improvement upon previously reported growths in the literature. These large crystals enabled our group to perform a wide range of experiments that were previously restricted to polycrystalline materials. It may be feasible to extend these methods to the synthesis of similar compounds.

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