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A Preliminary Synthesis of Ruthenium-doped Oxyfluoride Perovskites[1] MICHAEL SHAH, California State University, Los Angeles, RITESH UPPULURI, Penn State University, University Park, PREM-MRSEC COLLABORATION — Layered perovskites are structures of anionic perovskite blocks interleaved with metal cations and their rich chemistry makes them amenable topochemical reactions. Layered oxide materials are used in diverse applications such as superconductors, semiconductors, ferroelectrics and photovoltaics. Late transition metal perovskites are particularly interesting due to their correlated electronic properties. This study sought to create ruthenium-doped layered oxyfluoride perovskites due to ruthenium's d^n electrons which may give rise to metallic phases and can also be exfoliated. Ruthenium-doped oxyfluoride perovskites were synthesized by first preparing a titano-niobate phase ($LaNbTiO_6$) followed by intercalation of rubidium fluoride (RbF). Samples were characterized using X-ray diffraction, Scanning Electron Microscopy and Energy Dispersive X-ray Spectroscopy to give phase and composition information. The precursor phase $LaNbTiO_6$ was produced during the heating process and conditions were optimized.. Ruthenium doping on the B'-Site (Titanium) was shown to have increased the occurrence of the impurity phase ($LaNbO_4$), whilst doping on the B-Site (Niobium) was shown to have decreased this impurity phase but gave rise to a pyrochlore phase ($La_2Ti_2O_7$). Phase pure doped samples were made.

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Michael Shah
California State University, Los Angeles

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