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ABSTRACT

$BiCu_{0.4}Mn_{0.6}O_3$ and $K_{0.4}Pb_{1.6}FeMoO_6$: New Functional Perovskites Stabilized via High-Pressure/High-Temperature Synthesis

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High Pressure/High Temperature (HP/HT) solid-state reactions represent a powerful synthesis approach for stabilizing novel compounds in fundamental materials science. These extreme conditions can induce rare crystallographic symmetries that host multifunctional and exotic properties, such as multiferroicity. In perovskite systems (ABO_3), the exceptional tolerance to chemical substitutions and structural distortions allows for the strategic combination of different ions at the A and B sites, enabling fine-tuning of their physical properties.
In this work, we present the successful synthesis and comprehensive structural, magnetic, and electrical characterization of two novel perovskites: $BiCu_{0.4}Mn_{0.6}O_3$ (BCMO) and $K_{0.4}Pb_{1.6}FeMoO_6$ (KPFMO). Our findings reveal promising multifunctional properties, shedding light on the potential of these materials and paving the way for further exploration of their solid solutions.