

Zur Kenntnis rhomboedrischer Perowskite (La,Sr)(Mn,Fe)O₃

Contributions to the Chemistry of Rhombohedral Perovskites (La,Sr)(Mn,Fe)O₃

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Perovskites La_{1-x}Sr_xMn_{1-x}Fe_xO_{3+δ} ($x = 0.1 - 0.5$) were prepared by a freeze-drying method and for comparison by conventional solid state reaction. Freeze-dried precursors are more reactive, forming the final perovskites at lower temperatures and within shorter reaction times. Under the reaction conditions employed (air atmosphere, 800 – 1350 °C), the perovskite La_{0.9}Sr_{0.1}Mn_{0.9}Fe_{0.1}O₃ was obtained in an orthorhombic modification. By annealing under oxygen at 800 °C, however, a rhombohedral modification La_{0.9}Sr_{0.1}Mn_{0.9}Fe_{0.1}O_{3.1} with an excess oxygen content can be prepared. The structures of the other perovskites of the series ($x = 0.2 - 0.5$) were refined on the assumption of a rhombohedral distortion of the ideal perovskite structure (space group $R\bar{3}c$). There are characteristic correlations between composition of samples, volume and distortion of the AO₁₂- and BO₆-polyhedra in the ABO₃ structure.

Key words: Perovskites (La,Sr)(Mn,Fe)O₃, Freeze-Drying Method, Rietveld Refinement, Polyhedral Analysis