Synthese und Charakterisierung der Lanthanoidbleoxidnitrate
\( LnPbO_2NO_3 \) mit \( Ln = \text{La, Pr, Nd und Sm} \)

Synthesis and Characterisation of Lanthanide Lead Oxide Nitrates \( LnPbO_2NO_3 \) with \( Ln = \text{La, Pr, Nd, and Sm} \)

Simone Dill\textsuperscript{a}, Yoriko Kawamoto\textsuperscript{a}, Inga Grigoraviciute\textsuperscript{b}, Aivaras Kareiva\textsuperscript{b} und Hans-Jürgen Meyer\textsuperscript{a}

\textsuperscript{a} Institut für Anorganische Chemie der Universität Tübingen, Auf der Morgenstelle 18, D-72076 Tübingen, Deutschland
\textsuperscript{b} Department of General and Inorganic Chemistry, Vilnius University, Naugarduko 24, Vilnius LT-2006, Lithuania

Sonderdruckanforderungen an Prof. H.-J. Meyer. E-mail: juergen.meyer@uni-tuebingen.de


The lanthanide lead oxide nitrates \( LnPbO_2NO_3 \) with \( Ln = \text{La, Pr, Nd, and Sm} \) were synthesised by solid state reactions of the nitrates in air and subsequent reactions in sealed silica tubes under \textit{in situ} generated \( \text{NO}_x \) atmosphere. The crystal structure of \( \text{LaPbO}_2\text{NO}_3 \) was refined isotypically with \( \text{BiPbO}_2\text{NO}_3 \) in the tetragonal space group \( I4/mmm \) by means of Rietveld powder XRD. According to this refinement, an orientational disorder is present for the \( \text{NO}_3^- \) ions. The homologous \( LnPbO_2\text{NO}_3 \) compounds were indexed isotypically for \( Ln = \text{Pr, Nd, and Sm} \), and their lattice parameters were refined. The structures contain \( \text{[LaPbO}_2]^+ \) layers, alternating with single \( \text{[NO}_3^- \) layers. Thermal analyses (DTA/TG) were performed for \( LnPbO_2\text{NO}_3 \) compounds and magnetic measurements for \( \text{NdPbO}_2\text{NO}_3 \). The employment of \( \text{LaPbO}_2\text{NO}_3 \) as a precursor for oxide materials, or as an \( \text{NO}_x \) storage material is considered.

\textit{Key words:} Lanthanide Lead Oxide Nitrate, Structure, Thermal Decomposition, \( \text{NO}_x \) Storage