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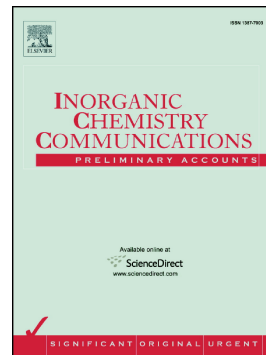
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Three-Dimensional Architectures Based on 1:1 type Lanthanide-Substituted Keggin-Type Polyoxometalates and Lanthanide Cations

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Abstract

Two new inorganic frameworks $\text{HLa}(\text{H}_2\text{O})_5[\text{La}(\text{H}_2\text{O})_6]_2[\text{La}(\text{H}_2\text{O})_2(\text{GeW}_{11}\text{O}_{39})]_2 \cdot 7\text{H}_2\text{O}$ (**1**) and $\text{HK}(\text{H}_2\text{O})\text{La}_3(\text{H}_2\text{O})_{15}[\text{La}(\text{H}_2\text{O})_3(\text{GeW}_{11}\text{O}_{39})]_2 \cdot 38\text{H}_2\text{O}$ (**2**) based on 1 : 1 type lanthanide-substituted polyoxometalates (LSPs) have been synthesized under hydrothermal reactions. Compounds **1** and **2** are characterized by single-crystal X-ray diffraction analysis, thermogravimetry analysis, infrared spectroscopy and X-ray powder diffraction analysis. Interestingly, Compounds **1** and **2** can be selectively obtained by simply controlling the reaction temperatures under similar conditions. Both **1** and **2** are three-dimensional structures built from lanthanide-substituted polyoxoanions $[\text{La}(\text{H}_2\text{O})_n(\text{GeW}_{11}\text{O}_{39})]^{5-}$ building blocks. Furthermore, the ion-conducting properties of **1** and **2** were investigated.

Keywords: Hydrothermal synthesis; Polyoxometalates; Lanthanide; Keggin; Ion-conducting

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