

Synthesis and structural characterization of a new molecular precursor for BaHfO₃: a simple approach to Eu-based phosphors.

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Streszczenie

A single-source molecular precursor [Ba₄Hf₂(μ₆-O)(μ₃,η²-OR)₈(μ-OR)₂(μ-ROH)₄Cl₄] (ROH = CH₃OCH₂CH₂OH) for mixed-metal oxide materials was prepared via elimination of the cyclopentadienyl ring from Cp₂HfCl₂ as CpH, in the presence of Ba(OR)₂ in an alcohol ROH as a source of protons. The precursor was characterized by elemental analysis, infrared (IR) and nuclear magnetic resonance (NMR) spectroscopy, and single-crystal X-ray structural analysis. This complex undergoes thermal decomposition at 800 °C to a BaCl₂/BaHfO₃ mixture. After barium dichloride has been leached from the raw powder using deionized water, the resulting particles are of submicrometer size (30–50 nm). Preliminary studies of barium hafnate doped with Eu³⁺ sintered at 900 °C showed that a dominant luminescence band belongs to the strong electric dipole transition ⁵D₀ → ⁷F₂.

Słowa kluczowe

barium hafnate, perovskite, single-source precursor (SSP), phosphors

Adres publiczny

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<https://www.acs.org/content/acs/en.html>