

Synthesis and characterization of mixed-metal aryloxo-organometallic precursors for oxide-ceramic materials.

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Streszczenie

Potential single-source molecular precursors $[\text{Ba}\{\mu\text{-ddbfo}\}_2\text{MR}_x]_2$ (ddbfoH = 2,3-dihydro-2,2-dimethylbenzofuran-7-ol; M/R/x = Al/Me/2, Al/Et/2, Ga/Me/2, or Zn/Et/1) for mixed metal oxide materials were prepared by the reaction of barium aryloxo $[\text{Ba}(\text{ddbfo})_2(\text{ddbfoH})_2] \cdot 3\text{ddbfoH}$ with an appropriate organometallic compound in toluene. The precursors were characterized by elemental analysis, IR and NMR spectroscopy, and single-crystal X-ray structural analysis. The Ba/Al₂ and Ba/Ga₂ complexes undergo thermal decomposition to give mixed metal oxides BaM₂O₄ (M = Al, at 1300 °C for both Me and Et derivatives; Ga, at 1430 °C). Instead, the Ba/Zn₂ complex decomposes to a mixture of BaCO₃ and different metal oxides. The chemical composition and surface morphology of heterobimetallic oxides were analyzed by SEM-EDS and X-ray powder diffraction (XRD) that revealed the formation of highly pure oxide materials with micrometer particle sizes.

Słowa kluczowe

Barium, Oxides, Metals, Ligands, Precursors

Adres publiczny

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