Synthesis of functionalized materials using aryloxo-organometallic compounds toward spinel-like MM'_2O_4 ($M=Ba^{2+}$, Sr^{2+} ; $M'=In^{3+}$, Al^{3+}) double oxides.

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The predesigned single-source precursors $[Ba\{(\mu\text{-}ddbfo)_2InMe_2\}_2]$ (**1**), $[Me_2In(\mu\text{-}ddbfo)]_2$ (**2**), $[Sr\{(\mu\text{-}ddbfo)_2AlMe_2\}_2]$ (**4**), and $[Me_2Al(\mu\text{-}ddbfo)]_2$ (**5**) (ddbfoH = 2,3-dihydro-2,2-dimethylbenzofuran-7-ol) for spinel-like double oxides and group 13 oxide materials were prepared via the direct reaction of the homoleptic aryloxide $[M(ddbfoH)_4](ddbfo)_2\cdot ddbfoH$ ($M = Ba^{2+}$, Sr^{2+} (**3**)) and $InMe_3$ or $AlMe_3$ in toluene. In all of the reactions, there was an organometallic-driven abstraction of the OH protons from the 7-benzofuranols in the Ba^{2+} and Sr^{2+} cation sphere. All compounds were characterized by elemental analysis, ^1H NMR, and FT-IR spectroscopy. In addition, the molecular structures of **1**, **2**, and **3** were determined by single-crystal X-ray diffraction. The oxide products derived from the compounds mentioned above were studied using elemental analysis, Raman spectroscopy, X-ray powder diffraction, and scanning and transmission electron microscopy equipped with an energy-dispersive spectrometer. Moreover, their specific surface area and mesopore size distribution were evaluated using nitrogen porosimetry. Preliminary investigations of the Eu-doped $SrAl_2O_4$ and In_2O_3 phosphors revealed that the oxides obtained could be considered as matrices for lanthanide ions.

Adres publiczny

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