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Synthesis of Cobalt Oxide Film by Thermal Decomposition for Potential Various Applications

Seong Ho Han^{1,2}, Bo Keun Park¹, Seong Uk Son², Chang Gyoung Kim¹, and Taek-Mo Chung^{1*}

¹Thin Film Materials Research Group, Korea Research Institute of Chemical Technology, 141 Gajeong-Ro, Yuseong-gu, Daejeon 305-600, Republic of Korea, ²Department of Chemistry, Sungkyunkwan University, 2066, Seobu-Ro, Jangan-gu, Suwon 440-746, Republic of Korea

Cobalt oxide has excellent various properties such as high catalytic activity, antiferromagnetism, and electrochromism. So cobalt oxides offer a great potential for their applications in the various areas such as optical gas sensor, catalysts for oxidation reaction, electrochromic devices, high temperature solar selective absorbers, magnetic materials, pigment for glasses and ceramics, and negative electrodes for lithium-ion batteries. We have synthesized novel cobalt complexes by simple reaction of cobalt bistrimethylsilylamide as a starting material with a lot of conventional ligands as potential cobalt oxide precursors. The studies include the facile preparation, structural characterization, and spectroscopic analysis of the new precursors. We are making efforts to grow cobalt oxide thin films using cobalt complexes newly synthesized in this study using deposition techniques.

Keyword: cobalt oxide

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Synthesis and Characterization of New Nickel Sulfide Precursor

Sang Chan Lee, Bo Keun Park, Taek-Mo Chung, Chang Seop Hong and Chang Gyoung Kim

Korea University

Nickel sulfide (NiS) has been utilized in optoelectronic applications, such as transformation-toughening agent for materials used in semiconductor applications, catalysts, and cathodic materials in rechargeable lithium batteries. Recently, high quality nickel sulfide thin films have been explored using ALD/CVD technique. Suitable precursors are needed to deposit thin films of inorganic materials. However, nickel sulfide precursors available for ALD/CVD process are very limited to nickel complexes with dithiocarbamate and alkanethiolate ligands. Therefore, it is essential to prepare novel nickel sulfide suitable for ALD/CVD processes. Herein we report on the synthesis and characterization of new nickel sulfide complex with designed aminothioliolate ligand. Furthermore thin films of NiS have been prepared on silicon oxide substrates by spin coating nickel precursor 10 wt% in THF. The novel complex has been characterized by means of ¹H-NMR, elemental analysis, thermogravimetric analysis (TGA), X-ray Diffraction (XRD) and scanning electron microscope (SEM)

Keywords: Nickel, sulfide