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SOL-GEL SYNTHESIS OF Mg(X)/Al (X = Mn, Co, Ni, Cu, Zn) LAYERED DOUBLE HYDROXIDES

L. Valeikiene, R. Paitian, I. Grigoraviciute-Puroniene, A. Kareiva
Faculty of Chemistry and Geosciences, Institute of Chemistry, Vilnius University, Naugarduko 24, LT-03225 Vilnius, Lithuania
** E-mail: Ligita.valeikiene@chgf.vu.lt*

Layered double hydroxides (LDH) is a class of layered materials based on brucite ($Mg(OH)_2$) crystal structure. A general chemical formula of the material can be expressed as $[M^{2+}_{1-x}M^{3+}_x(OH)_2]^{x+}(A^{y-})_{x/y}\cdot zH_2O$, where M^{2+} (Mg, Zn, Ni, Co,. . .) and M^{3+} (Al, Ga, Cr,. . .) are divalent and trivalent metal cations respectively, A^{y-} is a intercalated anion which is located in the interlayer spaces along with water molecules. A^{y-} compensates the positive charge created by the partial substitution of M^{2+} by M^{3+} in a positively charged metal hydroxide layers. [1,2].

In present study, the Mg(X)/Al (X=Mn, Co, Ni, Cu, Zn;) compounds were synthesized via aqueous sol-gel method. Their mixed metal oxides were obtained after thermal treatment at 650 °C and subsequently reconstructed in water to layered structure. Synthesized materials were characterized using XRD, SEM, BET and FTIR analysis.

References:

1. Miyata, S., 1983. Anion-exchange properties of hydrotalcite-like compounds. Clay Clay Miner**. 31**, 305–314.
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