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Structural Characterization of Mg/Al hydrotalcite-like Compounds and their Thermal Stability SHUHUA ZHANG, SIYUAN YANG, College of Chemistry and Chemical Engineering, Shanghai University of Engineering Science, Shanghai 201620, China, CHENG WANG, Advanced Light Source division, Lawrence Berkeley National Laboratory, Berkeley 94720, CA, US, WEIJUN LIU, College of Mechanical Engineering, Shanghai University of Engineering Science, Shanghai 201620, China, XIAODAN GU, Department of Polymer Science and Engineering, University of Massachusetts Amherst, MA 01002, US, WENJUN GAN, XIAOYU XUE, College of Chemistry and Chemical Engineering, Shanghai University of Engineering Science, Shanghai 201620, China — Hydrotalcite-like compounds, repersented by the formula $[M^{2+}_{1-x}M^{3+}_{x}(OH)_2]X^{n-}_{x/n} \cdot nH_2O$ (M^{2+} = Ni^{2+}, Mg^{2+}, Cu^{2+},etc; M^{3+} =Al^{3+}, Fe^{3+}, etc; X^{n-} =CO^{2-}_3, NO^{-}_3, etc) possess the brucite-like layers [$Mg(OH)_2$] with positive charge and anionic compounds in the interlayer to form neutral materials. Catalytic effects to decompose NO_x from automobile exhaust were highly related with the difference of M^{2+} and thermal stability because the catylists locate are about $200 \sim 500°$. In this paper, Mg-Al-Cu and Mg-Al-Ni hydrotalcite-like compounds were characterized by XRD and FT-IR spectra and the thermal stability were analyzed by TGA and DTA. Even though they both have the typical diffraction peaks of hydrotalcites, but their interlayer spaces are different. Some weak chemical bonds were observed to be formed in Mg-Al-Ni hydrotalcites by FT-IR. Mg-Al-Ni hydrotalcite-like compound degraded at lower temperature, by contrast, Mg-Al-Cu hydrotalcite has the better structural stablilty and thermal stability.

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