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## Mixed chromium and aluminum oxides elaborated by a sol-gel process. I. Chemistry of the preparation

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### Abstract

Gels of mixed chromium and aluminum oxide were prepared by a sol-gel process. The precursor is a mixture of  $\text{Al}(\text{O-s-Bu})_3$  and  $\text{Cr}(\text{acac})_3$  with a mass ratio  $\text{Al}/\text{Cr} = 10$  in sec-butanol. Gelation occurred by adding acetic acid. The amount of added acetic acid is represented by the ratio  $k = [\text{CH}_3\text{COOH}]/[\text{Al}(\text{O-s-Bu})_3]$ , with  $k$  varying between 0.5 and 3. Acetic acid played crucial roles in both hydrolysis and polycondensation, (1) producing water in situ by esterification, (2) modifying the precursor by substituting some of the O-s-Bu ligands by acetate ligands, and (3) catalyzing the polycondensation. The importance of each of these roles in the process as well as the nature of the products varied with the ratio  $k$ . [Author abstract; 22 Refs; In English]

**Index Terms:** Catalysts; Polycondensation; Hydrolysis; In situ processing; Esterification; Alumina; Acetic acid; Infrared spectroscopy; Gelation; Chromium compounds; Chemical bonds; X ray diffraction analysis; Electron spectroscopy; Molecular precursors