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**Study of alumina synthesis by sol-gel process using 2n factorial experimental design**

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Pseudoboehmite was prepared by sol-gel process using aluminum nitrate as precursor. The 2n full factorial experimental design was used for studying 3 variables: temperature of synthesis, the concentration of ammonium hydroxide (wt %) and the pH adjusts of the aluminum nitrate solution with ammonium carbonate. The samples of the eight syntheses (obtained in different conditions) were characterized by: specific surface area of calcined samples (at 500o C), scanning electron microscopy, thermo gravimetric analysis (TG) and differential scanning calorimetry (DSC). The products of the eight syntheses were calcined at 1100o C during 4 hours and the X-rays powder diffraction of these samples was obtained. The results show that the DSC and TG curves are similar with the data of the literature. The X-rays powder diffraction of the samples calcined at 1100o C shows that all samples present the  $\gamma$ -alumina structure.