

Study of boehmite nanoparticles prepared by the continuous supercritical hydrothermal synthesis.

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Alumina is one of the most widely used oxide ceramic material. It exists in many polymorphic phases γ -, δ -, θ -, η -, κ -, χ -, ϵ - and α - Al_2O_3 . Aluminum oxide powders are used for various industrial applications like catalysts, refractories, abrasives or insulators. Most of these phases can be synthesized by dehydration of the aluminium oxyhydroxide, boehmite γ - $\text{AlO}(\text{OH})$, which makes this material a precursor choice.

In this work, boehmite nanoparticles are synthesized using supercritical water in a continuous reactor. Under supercritical conditions, the reaction kinetics increase allowing the synthesis of pure and crystalline inorganic nanoparticles in only few seconds. Furthermore, the nanoparticle size and morphology strongly depend on the parameters such as residence time, temperature, pH and precursor concentration. We propose to modify these parameters in order to synthesize different types of boehmite. Those materials will be then characterized by XRD, HRTEM, Electron Diffraction and thermal analysis.

