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Synthesis, characterization and combined kinetic analysis of thermal decomposition of Hydrotalcite ($Mg_6Al_2(OH)_{16}CO_3.4H_2O$)

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cnouHightlights

- Hydrotalcite ($Mg_6Al_2CO_3(OH)_{16}.4H_2O$) is synthesized by coprecipitation.
- The thermal decomposition comprises dehydration, dehydroxilation and decarbonation.
- The last two processes strongly overlap and needs to be separated by deconvolution.
- The Kinetics of resolved stages are studied by combined and isoconversional analysis.
- The kinetic model is based on the diffusion of species out of the laminar structure.

Abstract

Here, a kinetic study of the thermal decomposition of synthesized hydrotalcite, $Mg_6\ Al_2\ CO_3\ (OH)_{16}\ .4H_2O$, has been carried out using thermogravimetric experiments in air atmosphere. It is shown that the thermal decomposition occurs in two well differentiated stages. The first one is a single-step dehydration process that comprises the release of four water molecules. On the other hand, the second stage is complex and corresponds to both dehydroxylation and decarbonation processes which occur simultaneously. The kinetic parameters describing all