
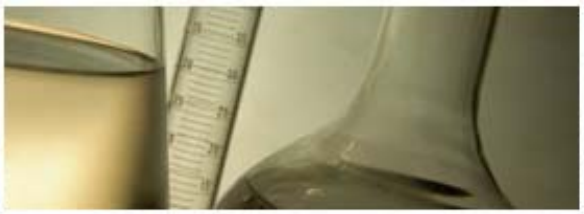

MainPage
About College
Files
Researches
Courses
Favorite Links
Our Contacts

Research Details :

Research Title : *Thermal decomposition of ammonium trioxalatoferrate(III) trihydrate in air*

Thermal decomposition of ammonium trioxalatoferrate(III) trihydrate in air

Descriptipn : The thermal decompostition of ammonium trioxalatoferrate(III) trihydrate in air has been studied using DTA-TG, electrical conductivity, SEM, XRD, FTIR and Mossbauer effect measurements. The first stage of decomposition of (NH4)(3)[Fe (C2O4)(3)]. 3H(2)O, starting at about 100 degrees C, corresponds to evolution of the water of hydration and is followed by the second stage in which the sample ignites at around 260 degrees C and burns rapidly to form finely divided iron(III) oxide. DC-electrical conductivity measurements showed two breaks corresponding to the two decomposition stages. Kinetic analysis of the two stages of the decomposition reactions was performed under isothermal conditions and the results were compared with those obtained under non-isothermal conditions using different integral methods of analysis. The fractional reaction-time data showed a sigmoid relationship and obeyed the Avrami-Erofeev equation characteristic of a solid-state nucleation-growth mechanism and consistent with the textural changes that accompany the decomposition, as revealed by SEM experiments. Mossbauer spectra of samples calcined at different temperatures are discussed and show that in the early stages of the decomposition at about 300 degrees C, part of the Fe(III) oxide is formed in a superparamagnetic doublet state. As the temprature is increased, the crystallites grow and supermagnetism disappears..

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