THERMAL DECOMPOSITION OF IRON(III) SULFATE

Z. Marušák, R. Zbořil, L. Machala
Palacký University Olomouc, Czech Republic

Influence of conditions (temperature, particle size, diffusion conditions, layer thickness of the precursor and time of calcinations) on solid-state thermal decomposition of iron(III) sulfate in air towards iron(III) oxides and their polymorphous transformations are discussed. Mechanism of thermal decomposition and polymorphous transformations have been investigated mainly using ^{57}Fe Mössbauer spectroscopy, X-ray powder diffraction (XRD), and thermal analysis (DSC, DTA) methods. γ-Fe_2O_3 (maghemite) and β-Fe_2O_3 were identified as primary products of iron(III) sulfate decomposition. Particle size induced polymorphous transformations from maghemite to hematite via ε-Fe_2O_3 and simultaneously from β-Fe_2O_3 to hematite has a direct influence on thermal decomposition of residual iron(III) sulfate. This is related to a diffusion of gaseous SO_3 from the bulk of particle through iron(III) oxide surface layer. The overall decomposition mechanism is an unique exhibition of polymorphous transformations of iron(III) oxide.

Presenting author: **Zdeněk Marušák**
Address: **Centre for Nanomaterial Research, Šlechtitelů 11, 783 71 Olomouc-Holice**
FAX: **+ 420 58 563 4958**
E-mail: **marusak.zdenek@gmail.com**