

Kinetic Study of the Thermal Dehydration of SiO₂ and SiO₂-ZrO₂ composites prepared by Sol-Gel route

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Abstract.

SiO₂, ZrO₂ and SiO₂-ZrO₂ composites at different percentage of zirconia were synthesized by the sol-gel method and spectroscopically characterized by Fourier Transformed Infrared (FTIR) spectroscopy. Different series of composites were prepared and analysed, as it is and with a post-preparation conditioning at 600 and 1000°C respectively. The calcination were carried out to verify the changing in composite structure and if these treatments will affect the subsequently analyses. The synthesized samples were subjected to the thermogravimetric analysis (TGA) to investigate the kinetics of dehydration process. To this purpose, TGA data were treated by the Kissinger method to calculate the apparent activation energy (E_a) of dehydration. The obtained kinetics parameters are discussed and compared with each other and with those obtained for the control material.