

The mesoporous nano system Na₂OZnO-SiO₂ from zinc sulfate, sodium metasilicate and sodium carboxymethyl cellulose

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Abstract

Na₂O-ZnO-SiO₂ nano system were synthesized using zinc sulfate heptahydrate, sodium metasilicate and Sodium carboxymethyl cellulose. The Thermo Gravimetric and Differential Thermo gravimetric (TGA/DTA) analysis were done to study the thermal behavior of the as synthesized sample NaOHZn(OH)₂-Si(OH)₄. The peak at 443.6 °C in DTA may be related to the decomposition of NaOH-Zn(OH)₂-Si(OH)₄ into Na₂O-ZnO-SiO₂. The structural, optical properties, morphology and composition of Na₂O-ZnO-SiO₂ nano particles (NPs) were studied by various techniques such as XRD, FTIR, TEM, FESEM and EDAX. The antimicrobial activity were carried out against Gram positive and Gram negative bacteria and Na₂O-ZnO-SiO₂NPs showed inhibitory activity in both strains of bacteria with excellent selectivity against Gram-positive bacteria. This is an eco-friendly, time conservative and cost effective way of mesoporous nanoparticle production.

Biography:

Khalil beyki has received B.Sc. (High Hons.) degree from the University of Regina (Canada) in 1996. His Ph.D. was awarded from Rice University in 2000 (advisor Prof. Andrew R. Barron), for his work on the organometallic synthesis of volatile Group 13 compounds and their application for thin film growth via chemical vapor deposition.

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