The mesoporous nano system Na_2O-ZnO-SiO_2 from zinc sulfate, sodium metasilicate and sodium carboxymethyl cellulose

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Na_2O-ZnO-SiO_2 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 NaOH-$Zn(OH)_2$-$Si(OH)_4$. The peak at 443.6 °C in DTA may be related to the decomposition of NaOH-$Zn(OH)_2$-$Si(OH)_4$ into Na_2O-ZnO-SiO_2. The structural, optical properties, morphology and composition of Na_2O-ZnO-SiO_2 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 Na_2O-ZnO-SiO_2NPs 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.



