

Chromium Oxide Synthesis by Decomposition of Ammonium Dichromate Precipitated With Ultrasonic Waves

M.Keyhani, A.A. Derakhshan , L.Rajabi

*Polymer Research Center, Department of Chemical Engineering, RaziUniversity,
Kermanshah, Iran (Keyhani@Petrorazi.ir)*

Abstract

Chromium oxide (Cr_2O_3) is important as heterogeneous catalyst, coating material, wear resistance, advanced colorant, pigment and solar energy collector. However, its usual synthesis have harmful aspects. Therefore, developing fast and efficient methods with minimized hazardous by-product is necessary. Our strategy was based on ammonium dichromate decomposition as a green method with sole deposition of water steam and nitrogen to the environment. Decomposition of ammonium dichromate typically leads to producing fine particles. When saturated solution of ammonium dichromate at elevated temperatures cooled to ambient temperature under ultrasonic waves, excess dissolved material precipitated. Ultrasonic waves prevented the growth of crystalline grains, such that, final precipitate had smaller grain size. Similarly, the resulting chromium oxide obtained from this precipitated ammonium dichromate had smaller grain size too. SEM and XRD tests verified this fact for both precipitated ammonium dichromate and its decomposition product.