

EFFECT OF SURFACTANT/WATER RATIO AND REAGENTS' CONCENTRATION ON SIZE DISTRIBUTION OF MANGANESE CARBONATE NANOPARTICLES SYNTHESIZED BY MICROEMULSION MEDIATED ROUTE

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Abstract

In this work nanoparticles of manganese carbonate were produced by microemulsion-mediated route at room temperature, without any post thermal treatment. All produced samples were characterized by XRD and by TEM and obtained images were analyzed in order to evaluate particle size distribution, mean size and polydispersity (variance). The influence of water-surfactant molar ratio and concentration of reagents were investigated in the range 5-7.5 and 0.25-1.0 M, respectively, according to factorial design. Significant effects on particle mean size and polydispersity were assessed by statistical analysis. Results showed that by increasing the water-surfactant molar ratio from 5 to 7.5, the average particle size increased from less than 10 nm to around 100 nm, and the standard deviation increased from less than 5 nm to 35 nm. Statistical analysis put in evidence that water-surfactant molar ratio has significant positive effect on both mean and variance of particle size.

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