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Tin citrate particles as precursors for nanoparticles of SnO_2: the study of Tin Citrate particles growing

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Abstract – Tin citrate has been synthesized by precipitation from aqueous solution, starting from tin chloride and citric acid solutions. Several temperatures and concentrations its effects on nanoparticles features were evaluated by DOE. Tin citrate was characterized by FTIR, ESA, DRX, BET and XRF. Tin citrate is used as precursor for Pechini's method to obtain Mg doped SnO_2 nanoparticles.

Pechini method is largely applied to the synthesis of nano particle of some important inorganic solids[1]. Some cation to be added to the monomers solution must be transformed in a different salt in order to avoid further contamination and make its dissolution easier[2]. One problem of this step is the low productivity due to diluted solutions used to have some intermediates. One possible way is to use more concentrated solutions, but contaminants can interfere in the size and surface energy for wanted nano particles. [3]This study intends to discuss the influence of some parameters (temperature of precipitation and the concentration of starting solution) on the size and surface energy of nano particles. Tin citrate was prepared from tin chloride and citric acid aqueous solutions at different temperatures and different concentrations. Design of Experiments was used to quantify effects. Particles were characterized by means of Fourier Transformed Infrared Spectroscopy, Electrokinetic Sonic Amplitude, X-Ray Diffraction, BET and X-Ray Fluorescence. Results showed the influence of these evaluated factors (temperature of precipitation reaction and solution concentration).

References

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