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Microanalysis Species ZnO /$Zn(OH)_2$ Obtained by Chemical Precipitation

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The growing demand for materials that meetthe requirements of the applications of high technology bringsan exponential increase in the methodologies and techniques for both the synthesis and to characterize new materials. It is essential to identify and quantify the characteristics of a new material principally on a manometric. ZnO is a material which shows the greatest challenge in its characterization as it hasshown that their morphology and particle size are related to the combination of the synthesis conditions. Crystallographically more stable phase of ZnO is wurtzite, but also its chemical composition is important because it is possible that this hexagonal structure is present when one species of Zn(OH)2, ZnO and ZnS, but also shows complexity to study its morphologies as it can be of type spheres, stars, sheets, rods, columns, wire amongothers[1-2].

Two solutions were prepared by taking the stoichiometric ratio of $ZnSO_4 \cdot 7H_2O_{(ac)}$ + $2K(OH)_{(ac)}$ $\rightarrow K2SO_{4(ac)}$ + $Zn(OH)_{2(s)}$, the solution of $ZnSO_4 \cdot 7H2O$ to 2 M of 4.5 M KOH solution little in excess. Is added dropwise the solution of ZnSO4 (aq) to the alkaline solution. During the addition the mixture is kept with stirring receiving and ambient temperature of 25 °C, the addition time is 45 min, at the end of this addition is still kept stirring for 30 min. Subsequently the precipitates obtained were centrifuged and washed with distilled H_2O at room temperature to remove Na_2SO_4 formed in the reaction, verifies the presence of $SO_4^{2}$by adding drops of 1% solution of $BaCl_2$. After washing wet pastas are dried at 110 ° C for a period of 180 min.
The characterization of the crystallographic phases was realized by using Transmission Electron Microscopy (TEM), Energy Spectrum spectroscopy (EDS) and the EELS mapping was performed. The morphology of the ZnO particles synthesized in bright and dark field is showed in the Figure 1a and 1b respectively. Figure 2 shows the chemical composition distribution on the ZnO showing that the particles formed were of ZnO and Table 1 shows the quantity of the elements of the nanoparticles.

References:

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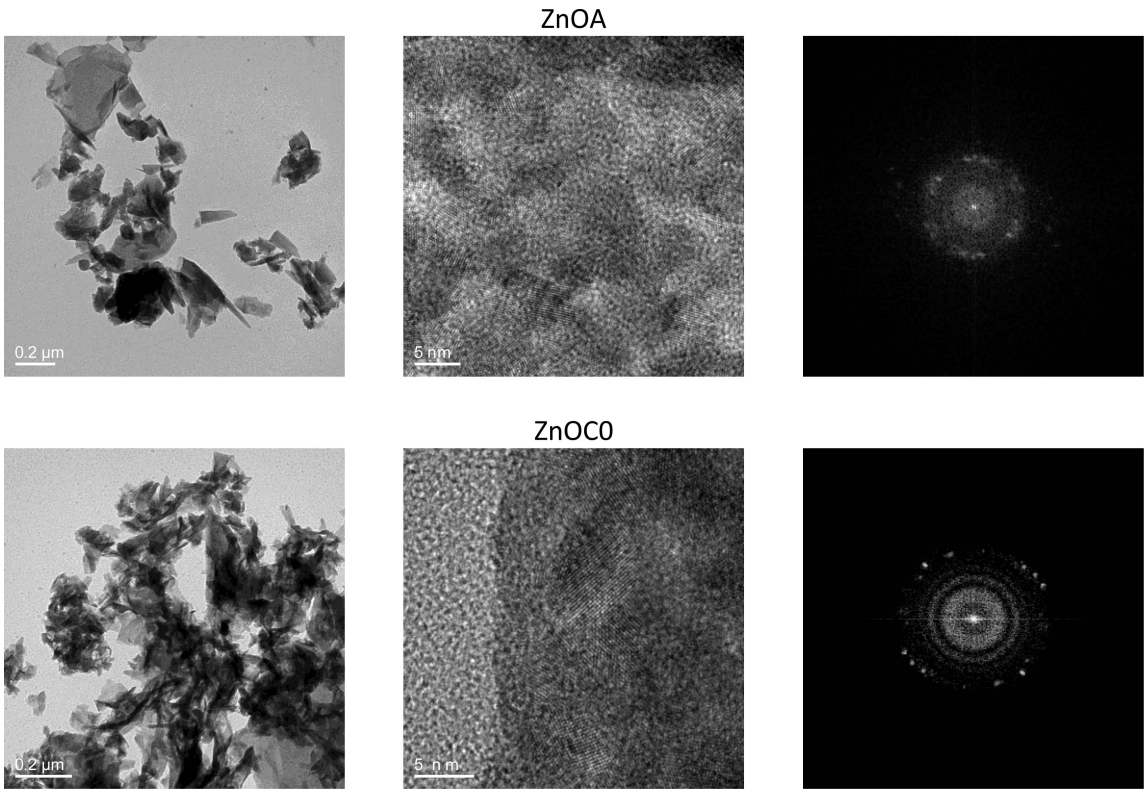

Figure 1. Identification of the morphology obtained in the three different routes of synthesis with NaOH precipitant ZnOA0 and KOH for ZnOC0.

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