

Nanocomposites and nanomaterials

Synthesis of 1D SnO₂ nanostructures by chemical vapor deposition

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Besides the choice of synthesis method, also the important step is the choice of process conditions. In the case of CVD method there are several processing parameters, such as evaporation temperature, type of precursor and synthesis duration, that have a significant influence on the morphology of obtained powders.

As was shown in [1] the formation of pure SnO₂ occurs at the processing temperature of 1123 K and treatment duration of 1 hour from different precursors. But the morphology of obtained powders depends on the precursor which used. 1D nanostructures of tin (IV) oxide are formed in the case of use ammonium oxalate as precursor. In this work the effect of the synthesis duration on the morphology of the obtained powders of SnO₂ was investigated. Tin (IV) oxide was obtained by decomposition of tin (II) oxalate in a tube furnace at 1123 K during 2, 4 and 8 hours. The results of scanning electron microscopy of synthesized samples (Figure 1) shows that with increasing of treatment duration the diameter of SnO₂ fibers passes through a maximum. It also was found that the formation of the fibers depends on the heating rate of furnace.

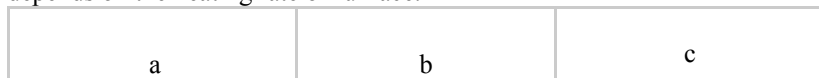


Fig. 1 SEM image of SnO₂ obtained by CVD method at 1123 K during 2 hours (a), 4 hours (b) and 8 hours (c)

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