The role of vapor composition in the formation of various ZnO nanostructures by a simple thermal evaporation

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The syntheses of controllable inorganic nanostructures in terms of size and shape have been strongly motivated by their size and shape dependent properties for their desired practical applications. Although many efforts have been made to synthesize the desired inorganic nanostructures, there have been only few attempts to obtain basic chemical understanding of how various nanostructures will be grown by chemical reactors. In this work, we present the effect of synthetic chemistry during the growth of the various ZnO nanostructures to a simple thermal evaporation. For this work, the various ZnO nanostructures such as nanobelts, nonorods, and other complex nanostructures were grown in a microstructure which the composition rates of oxygen and zinc could be changed during the syntheses process without temperature gradient. Finally, we investigated how the changes in the synthetic chemistry can affect the formation of the various ZnO nanostructures. These results will lead to better insights to develop various nanostructures for new functional applications.