

## ***IN-SITU* XRD ANALYSIS OF THE GROWTH OF ZnO NANOWIRES**

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Quasi-one-dimensional (1D) nanostructures of ZnO, with large aspect ratios and dimensions on the order of nanometers, have many potential applications such as photonics materials, gas sensors and nanogenerators. The synthesis of ZnO nanowires from zinc at moderately low temperatures (around 500°C) has been reported and attributed to a self-catalysis mechanism, in which molten zinc droplets serve both as a source of zinc and as a catalyst to promote the reaction with O<sub>2</sub>. The purpose of this study is to gain a greater understanding of the self-catalysis synthesis mechanism by collecting and analyzing *in-situ* X-ray diffraction data during the growth of ZnO nanowires. Data were collected at a range of temperatures from 350°C to 550°C, and the dependence of growth rate on temperature was investigated. Various morphologies were observed, including branched and unbranched nanowires, and the morphology was affected by synthesis parameters such as the heating rate and growth temperature. Increased understanding of the synthesis process should allow higher yields and better control of the nanowire morphology and properties.

## Information Page

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