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## Fabrication of ZnO Nanostructures with Various Growth Conditions by Vapor Phase Transport

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Zinc oxide (ZnO) structures have great potential in many applications. Currently, the most commonly used method to grow ZnO nanostructures are the vapor transport method (VPT). The morphology of the ZnO structures largely related to the growth conditions, including growth temperature, distance between the substrate and source, and gas ambient. Previously ZnO nanostructures with high crystallinity were obtained at the growth temperature of 800°C, in the argon and oxygen gas ambient. In this study, we report the properties of the ZnO nanostructures, which were synthesized on Au-catalyzed Si substrate by VPT, using a mixture of ZnO and graphite powders as source material under the different condition, including gas ratio of argon/oxygen and distance between substrate and source at the growth temperature of 800°C. The structural and optical properties of the ZnO nanostructures were investigated by field-emission scanning electron microscopy (FE-SEM), X-ray diffraction (XRD), and photoluminescence (PL).

**Keywords:** Zinc oxide, Vapor phase transport, Scanning electron microscopy, X-ray diffraction, Photoluminescence