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Early Stage Nucleation of ZnO Nanorods by Galvanic-Cell-based Approach

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Abstract

The galvanic-cell-based synthesis is considered as an effective method for the seed-layer free preparation of ZnO nanorods. However, the nucleation stage of the growth which decides the final structures of ZnO nanorods is still not well-understood. Here we show that the nucleation is almost completed after two minutes of growth and the galvanic-cell-based method results in a condensed ZnO layer beneath of the ZnO nanorods. Beyond this finding, we propose a hybrid approach that combines the galvanic and hydrothermal growth to fabricate the condensed-layer free, well-separated ZnO nanorods that might be compatible for the ZnO-based devices.

Keywords: Crystal growth, Electronics materials, Semiconductors, Interfaces

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