

A route for formation of microporous ZnO films

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Porous films based on semiconductor oxide materials have gained growing attention as potential materials for use in various fields requiring larger specific surface areas, such as catalysts, sensors, supercapacitors, photoelectrochemical energy converters, etc. This study reports a route to form microporous ZnO films, wherein in order to fabricate a porous thin film structure a vacuum annealing process for as-deposited dense ZnO–Zn composite films is employed. Based on the XRD, SEM and EDX data, it was shown that one-hour vacuum annealing of the ZnO–Zn films at 400 °C leads to the complete removal of excess Zn from the composite film, resulting in the formation of ZnO layers with a microporous structure.

Keywords: Zn, ZnO, film, composite, magnetron sputtering, vacuum annealing, porosity.

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