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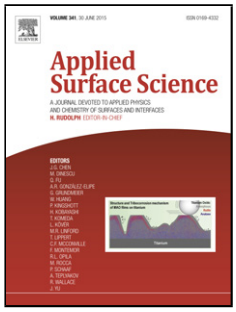

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Effect of morphology evolution on the thermoelectric properties of oxidized ZnO thin films

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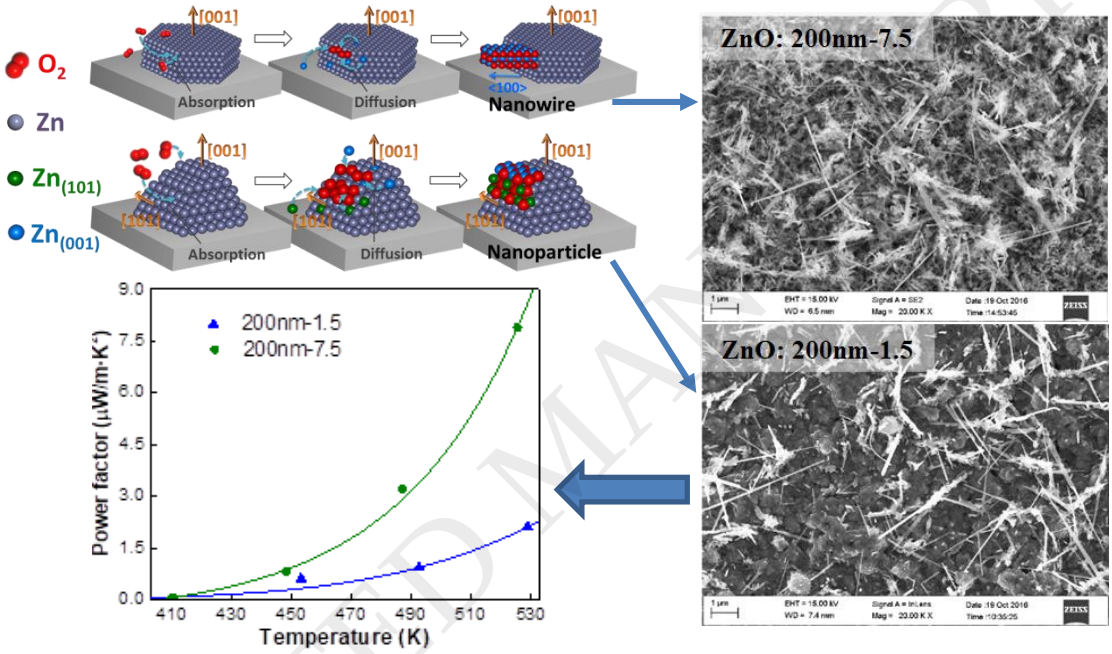
GRAPHICAL ABSTRACT



Highlights

- Surface morphology of ZnO is controlled by hexagonal and polyhedral morphologies of Zn film.
- Existence of nanowires leads a low concentration of oxygen vacancy in ZnO film.
- Optimized power factor is obtained in ZnO film with c-axis preferred nanowire.
- Effect of nanowire magnitude on band gap is greater than that of diameter.

Abstract

The effects of nanowire content on the thermoelectric properties of ZnO films were investigated. The nanowire content of ZnO films was tuned by thermal oxidation of evaporated Zn films. The results showed that hexagonal and polyhedral morphologies on the surface of Zn films can be used to tune the nanowire content of ZnO films. Hexagonal