Characterization of zinc oxide films deposited in helium-oxygen and argon-helium-oxygen atmospheres by sputtering

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Abstract:

Zinc oxide (ZnO) thin films were deposited onto glass substrates by radio frequency (RF) magnetron sputtering using a metallic zinc target. Zinc oxide films were prepared in two different gas atmospheres; in the first set, helium and oxygen gas flow ratio ($He:O_2$) was varied from 87.5% to 37.5%. In the second set of experiment, oxygen flow rate was kept constant at 2.5sccm while argon and helium gas flow ratio (Ar:He) was varied from 9.0% to 87.5%. The structural, wettability and optical properties of ZnO films were investigated by X-ray diffractometry (XRD), contact angle measuring system and UV-vis-NIR spectrophotometer. The XRD results show increased preferred orientation along (002) plane for deposited ZnO films in