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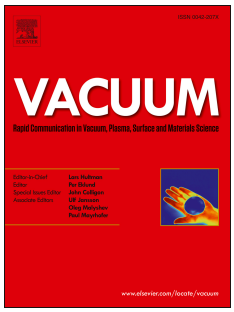

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Room temperature fabrication of transparent p-NiO/n-ZnO junctions with tunable electrical properties

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Abstract

Transparent p-n heterojunctions composed of p-NiO and n-ZnO thin films have been fabricated on indium-tin-oxide (ITO)-coated glass substrates at room temperature by magnetron sputtering. Various oxygen flow rates have been employed to the NiO thin films, yielding the tunable resistivity of NiO layers. These p-n junctions exhibit clear rectifying current-voltage characteristics. Moreover, their electrical properties can be effectively tuned by the oxygen flow rate to synthesize NiO layers in these junctions. NiO layer with closely perfect stoichiometry and quite high resistivity produces better performance in these p-n junctions, including the small threshold voltage and ideality factor, as well as high rectifying ratio. The