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Title: Controlling preferred orientation and electrical conductivity of zinc oxide thin films by post growth annealing treatment

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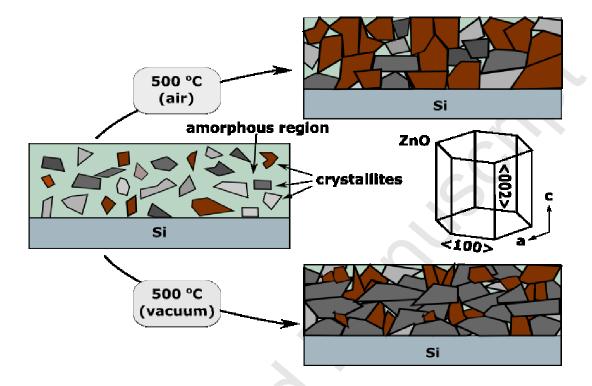
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## ACCEPTED MANUSCRIPT

### **Graphical abstract**



# Highlights

- Annealing dependent microstructural evolution and change in conductivity of ZnO films
- Preferential growth along (002) and (100) planes in air and vacuum annealed films
- Resistivity varied between  $10^6$  and  $10^{-2}\,\Omega cm$  depending on annealing conditions
- Hydrogen interstitials, and hydrogen-oxygen vacancy complexes affect the conductivity
- Narrow ZnO bandgap assigned to band tail effect related to intrinsic defects states

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