

# Heteroepitaxial Structure of ZnO Films Deposited on Graphene, SiO<sub>2</sub> and Si Substrates

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Heteroepitaxial growth remains as one of the continuously growing interests, because the heterogeneous crystallization on different substrates is a common feature in the fabrication processes of many semiconductor materials and devices, such as molecular beam epitaxy, pulsed laser deposition, sputtering, chemical bath deposition, chemical vapor deposition, hydrothermal synthesis, vapor phase transport and so on [1,2]. By using the R.F. sputtering system, ZnO thin films were deposited on graphene 4 and 6 mono layers, which is grown on 400 nm and 600 nm SiO<sub>2</sub> substrates, respectively. The ZnO thin layer was deposited at various temperatures by using a ZnO target. In this experimental, the working power and pressure were  $3 \times 10^{-3}$  Torr and 50 W, respectively. The base pressure of the chamber was kept at a pressure around  $10^{-6}$  Torr by using a turbo molecular pump. The oxygen and argon gas flows were controlled around 5 and 10 sccm by using a mass flow controller system, respectively. The structural properties of the samples were analyzed by XRD measurement. The film surface and carrier concentration were analyzed by an atomic force microscope and Hall measurement system. The surface morphologies were observed using field emission scanning electron microscope (FE-SEM).

## References

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