

Chemiresistive ammonia gas sensor based on graphene decorated with CuO nanoparticles

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Abstract

In this work, single-layer graphene decorated with CuO nanoparticles for sensing ammonia gas has been demonstrated. The CuO nanoparticles were synthesized by colloid-thermal method [1]. Single-layered graphene was grown using chemical vapor deposition (CVD) technique. The solution with CuO nanoparticles was applied to graphene surface by spin coating. The structure has been analyzed by SEM, EDS, XPS, XRD. The electrical properties of the sample with a different concentration of ammonia gas has been investigated at room temperature. The CuO nanoparticles changed catalytic and sensing properties of graphene, achieving a change of the conductivity of graphene due to changing charge carriers. Decorated graphene has shown fast response time and good detection limit.

References

- [1] Dong Ick Son, Chan Ho You, Tae Whan Kim, Applied Surface Science, 255 (2009) 8794–8797

Figures

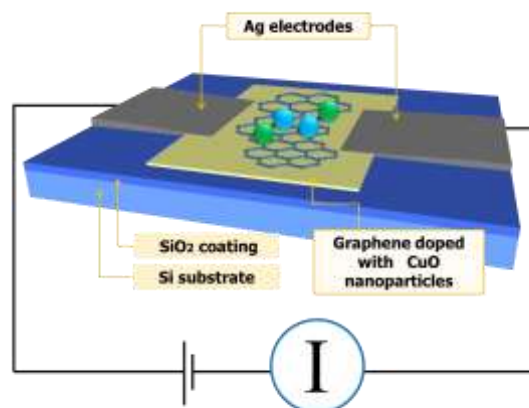


Figure 1: Schematic representation of the chemiresistive graphene sensor

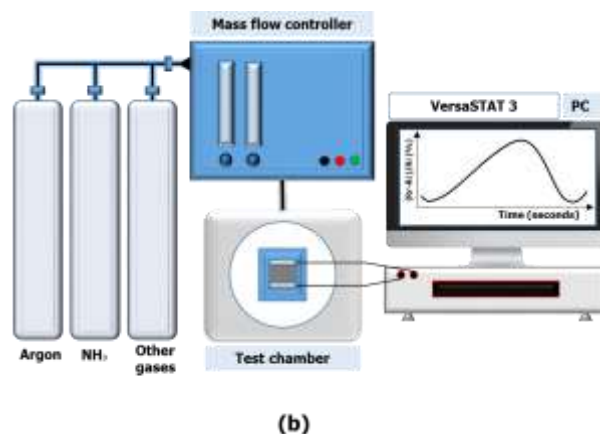


Figure 2: Schematic experimental setup for NH₃ gas sensing

