

# Oxygen-assisted Growth of Highly Conductive Graphene with Controllable Domain Size on Glass

## Abstract

The integration of graphene with glass has broad practical applications, such as smart windows and transparent heating glass, which could benefit people's daily life. Direct growth of graphene over glass is efficient and scalable way to fabricate graphene glass hybrid materials as it avoids the tedious transfer process that involved introduction of defects and contaminations into graphene film. However, the grain boundaries dominant the electrical conductivity of the poly-crystalline graphene films when the grain size is smaller than 800nm. [1] By introducing oxygen into the CVD system, the graphene films directly synthesized on glass with different domain size can be obtained, which performs different electrical properties. In particular, the domain size of graphene can be designed to in the range of 100nm to 800 nm in terms of controlling the amount of oxygen in the gas phase, and the corresponding sheet resistance of the fabricated graphene glass is in the range of 6.1k  $\Omega$  /sq to 0.9k  $\Omega$  /sq at the same transmittance of 90%. This method is a simple and effective way to enhance the electrical conductivity of graphene glass, and promote the development of its application in electronic devices.

## References

- [1] Ma, T.; Liu, Z. B.; Wen, J. X.; Gao, Y.; Ren, X. B. A.; Chen, H. J.; Jin, C. H.; Ma, X. L.; Xu, N. S.; Cheng, H. M.; Ren, W. C. Nature Communications, (2017) 8, 9.

## Figures

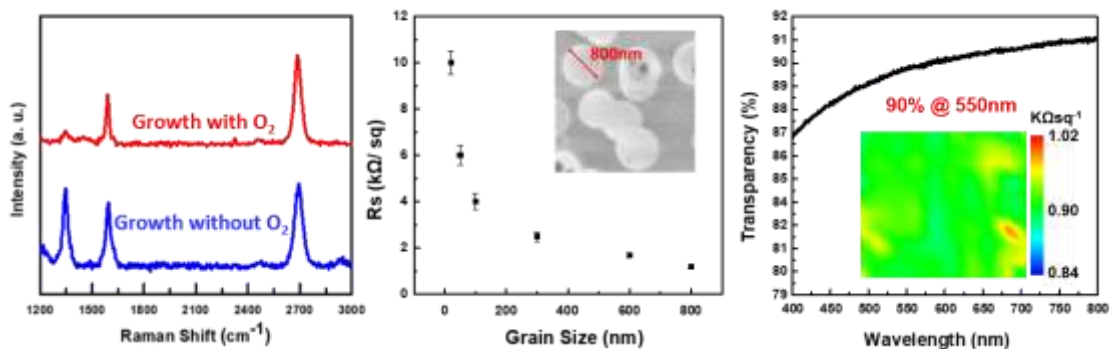


Figure 1: Oxygen-assisted Growth of Graphene with Controllable Domain Size on Glass