

# Graphene oxide based high-frequency modulation in electronics via optical illumination

Juyeong Oh, Seong Chan Jun\*

Department of Mechanical Engineering, School of Engineering, Yonsei University, 262 Seongsanno, Seodaemoon-gu, Seoul, Korea

\*[scj@yonsei.ac.kr](mailto:scj@yonsei.ac.kr)

## Abstract

Here, we report variation of scattering parametric properties in graphene oxide via illumination control. Graphene oxide was synthesized by chemically exfoliating graphite so that it has band properties while graphene has zero bandgap at K point. Since optoelectronic properties are highly affected by band gap properties, graphene oxide has been attracted tremendous attractions due to its controllable property [1-3]. Also, graphene oxide has potential for electronic devices since it partially has  $sp^2$  orbital which is basic building block for graphene [4]. However, observation in high frequency transmission modulated via optical signal has not been explored sufficiently, particularly, for demonstration of controlling wave intensity and wavelength for high frequency optoelectronics. In this demonstration, we prepared two types of graphene oxide device; first one is thick enough for low intensity to investigate intensity relation while the other is thin to verify photon energy relation. We hope that this investigation will be a foothold for high frequency transmission experiment for graphene oxide and other materials under illumination.

## References

- [1] Choi, et al, APL, **102** (2013) 131901.
- [2] Dean C, et al, Nature nanotechnology, **5** (2010) 722-6
- [3] Kamat PV, et al, The journal of Physical Chemistry Letters, **1** (2009) 520-7
- [4] Rani J, et al, Nanoscale, **5** (2013) 5620-7

## Figures

