

Engineering of optoelectrical properties of solution processed graphene-oxide based materials

Andrzej Chuchmała*

Łukasz Baisinger*, Leszek Cabaj**, Krzysztof Skupień**

*Wrocław Research Centre EIT+, ul. Stabłowska 147, 54-066 Wrocław, Poland

** 3D-nano, ul. Lipowa 3,30-702 Kraków

andrzej.chuchmala@eitplus.pl

Abstract

For wide application of graphene-based materials tools for tailoring of its physical properties are needed. Due to its remarkable optical and electrical properties, graphene is good candidate for application in areas such as optoelectronics. Optical and electrical properties of solution-based processed graphene oxide (GO) thin films were shown to be altered by doping with Ag nanoparticles [1]. In this research, reduced graphene oxide (rGO) layers doped by different nanoparticles (Ag with different shapes, Pt) was investigated. Nanoparticles doping was performed by two ways: one with depositing films from mix of GO and nanoparticles, and the second one by spin-coating additional, nanoparticle only layer on mixed film. It was shown, that Ag NPs (fig. 1) doped layers with additional Ag layer on top have lowest value of sheet resistance at the level of $94 \text{ k}\Omega/\square$, with high transparency (86%) for 500 nm (fig 2). It was observed, that additional nanoparticles layer on top of graphene oxide/nanoparticle mixed film reduce optical transparency by few percent.

Acknowledgment

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References

- [1] Andrzej Chuchmała, Marcin Palewicz, Filip Granek, 28th European Photovoltaic Solar Energy Conference and Exhibition, Paris, (2013) p. 336.

Figures

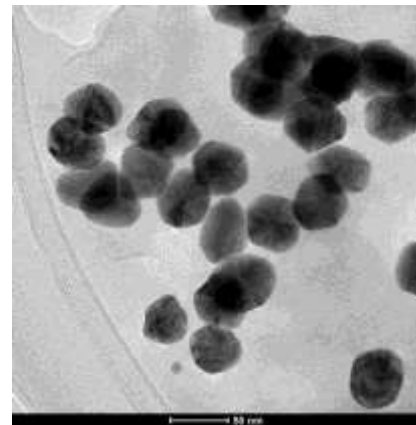


Figure 1: TEM image of Ag nanoparticles used for doping.

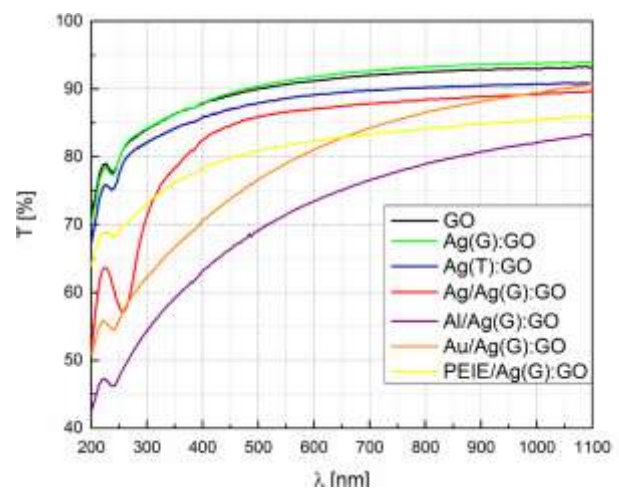


Figure 2: Changes in transparency for UV-VIS-NIR spectra induced by different doping materials.