

Electrochemical Properties and Applications of Graphene
Nano Platelets

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In most of graphene based electrochemical applications, graphene nano platelets (GNPs) have been applied. Their properties are expected to be different from single layered graphene.

In this presentation we focus on electrochemical properties of GNP regarding its electrochemical activity, potential window, and double-layer capacitance [1]. These properties will be compared with those of carbon nanotubes (CNTs). The application of GNP and CNT coated electrodes for electrochemical oxidation of endocrine disrupting chemicals will be shown. The GNP coated electrode is characterized with atomic force microscope and electrochemical techniques in detail. Compared with those on the CNT coated electrode, higher peak current for the oxidation of 4-nonylphenol is achieved on the GNP electrode together with lower capacitive current. Electrochemical oxidation of 2,4-dichlorophenol, bisphenol A, and octylphenol in the absence or presence of 4-nonylphenol is further studied on the GNP coated electrode. The results suggest that GNP has better electrochemical performance than CNT. Furthermore the deposition of Au nanoparticles on GNP and the application of Au/GNP for the detection of hydrazine will be shown [2]. In summary, GNP is more promising than CNT for electrochemical applications.

- [1] Q. Wan, H. Cai, Y. Liu, H. Song, H. Liao, S. Liu, N. Yang, *Chemistry–A European Journal*, **19**, 3483(2013).
[2] Q. Wan, Y. Liu, Z. Wang, W. Wei, B. Li, J. Zou, N. Yang, *Electrochemistry Communication*, **29**, 29(2013).