

# Electron Transfer of Methylene Blue on graphene monolayer electrodes

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**Michel Wehrhold**

Rodrigo M. Iost, Tilmann J. Neubert, Kannan Balasubramanian

*School of Analytical Sciences Adlershof (SALSA) & Dept. of Chemistry, Humboldt-Universität zu Berlin, 10099 Berlin*

[michel.wehrhold@student.hu-berlin.de](mailto:michel.wehrhold@student.hu-berlin.de)

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## Abstract

Methylene blue (MB) is a widely used redox indicator in chemical and biological sensors<sup>[1-3]</sup>. While the electron transfer (ET) properties of many other redox active molecules have been investigated on graphene monolayers<sup>[4]</sup>, there is little information available on the electron transfer interaction of MB at graphene monolayers. Here we have investigated the electrochemical properties of graphene using MB as a probe and deploying voltammetry. The measured data were analysed using different methods<sup>[5-6]</sup> to gain fundamental information about the heterogeneous rate constant for ET  $k^{\text{HET}}$ , the diffusion coefficient  $D_0$  and the extent of reversibility. Furthermore, by patterning graphene electrodes using photolithography we have investigated the effect of electrode size on the kinetic and thermodynamic aspects of electron transfer.

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