Electronic Supplementary Material (ESI) for Chemical Science.


# Single graphene nanoplatelets: capacitance, potential of zero charge and diffusion coefficient

## Supporting Information

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# Supporting Information

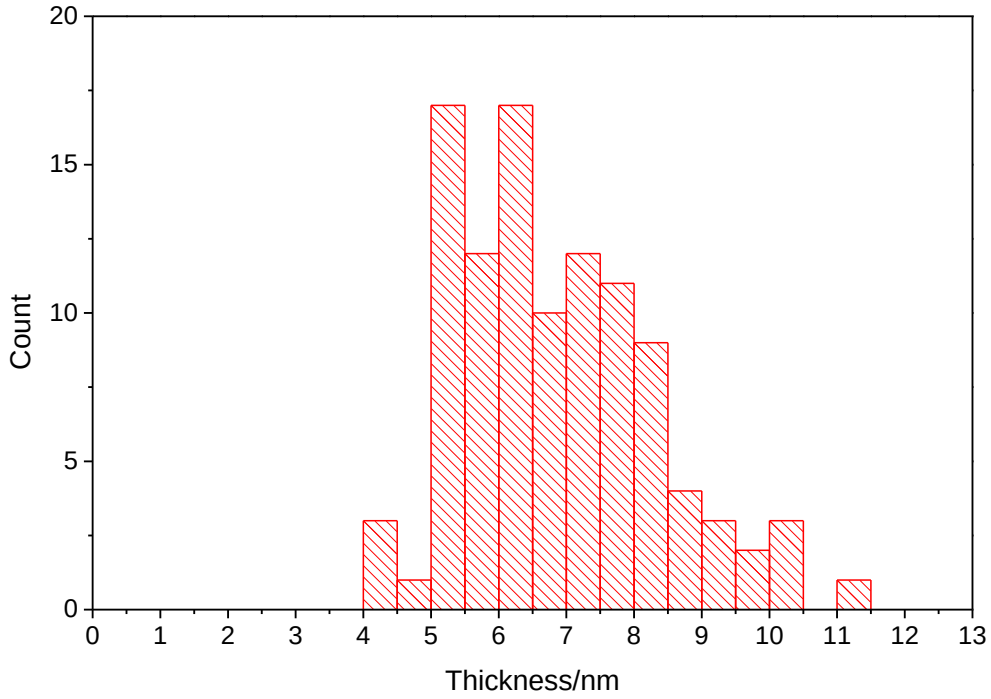


Figure S1: Histogram of thickness of graphene nanoparticles as inferred from SEM analysis with an average thickness of 7.1±2.1 nm. (n = 108, bin size = 0.5 nm)

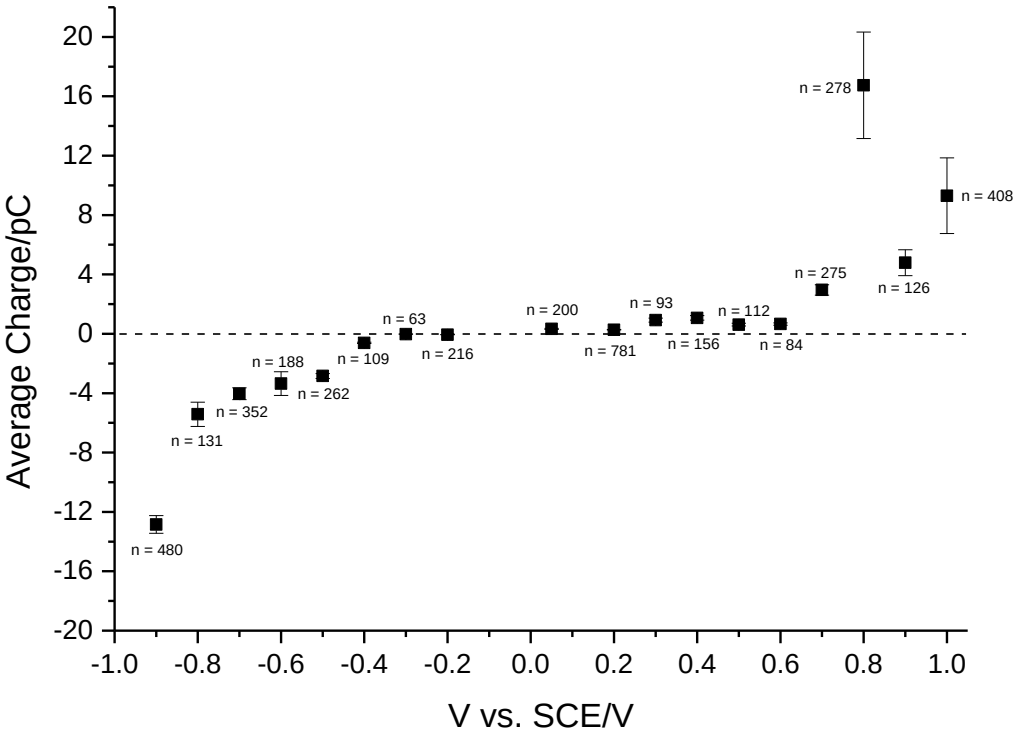


Figure S2: Plot of average impact charge vs. applied potential (vs. SCE) in 5.9 × $10^{-13}$ mol $dm^{-3}$ suspension. The n numbers indicate the number of impacts involved in generating each data point and its error bars.

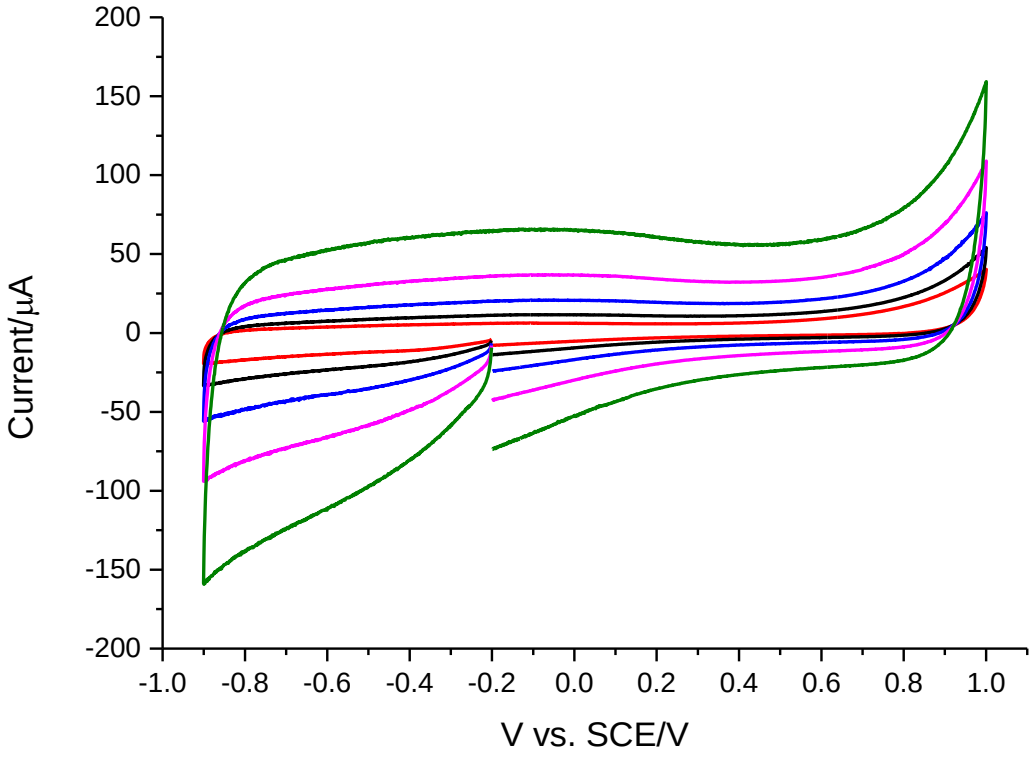


Figure S3: The voltammetric response of Graphene Nanoplatelets drop cast (7.9 µg) onto a glassy carbon electrode (BAS Technicol, USA, diameter 3 mm) in supporting electrolyte (0.1M KCl, 50 mM potassium monophosphate, 50 mM potassium diphosphate) recorded as a function of scan rates (25 mV $s^{-1}$, red line; 50 mV $s^{-1}$, black line; 100 mV $s^{-1}$, blue line; 200 mV $s^{-1}$, magenta line; 400 mV $s^{-1}$, green line).

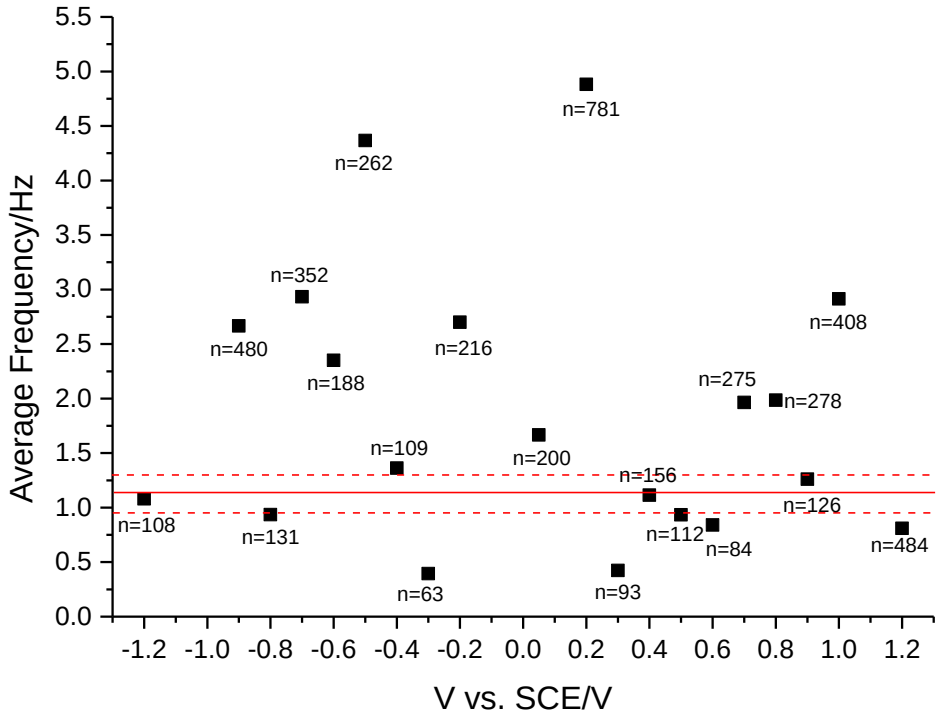


Figure S4: Plot of average impact frequency vs. potential applied (vs. SCE) in 5.91 × $10^{-13}$ mol $dm^{-3}$ suspension. The wide scatter indicates a lack of frequency bias with respect to the potential applied. The numbers n indicate the number of impacts the dots plotted are based on.

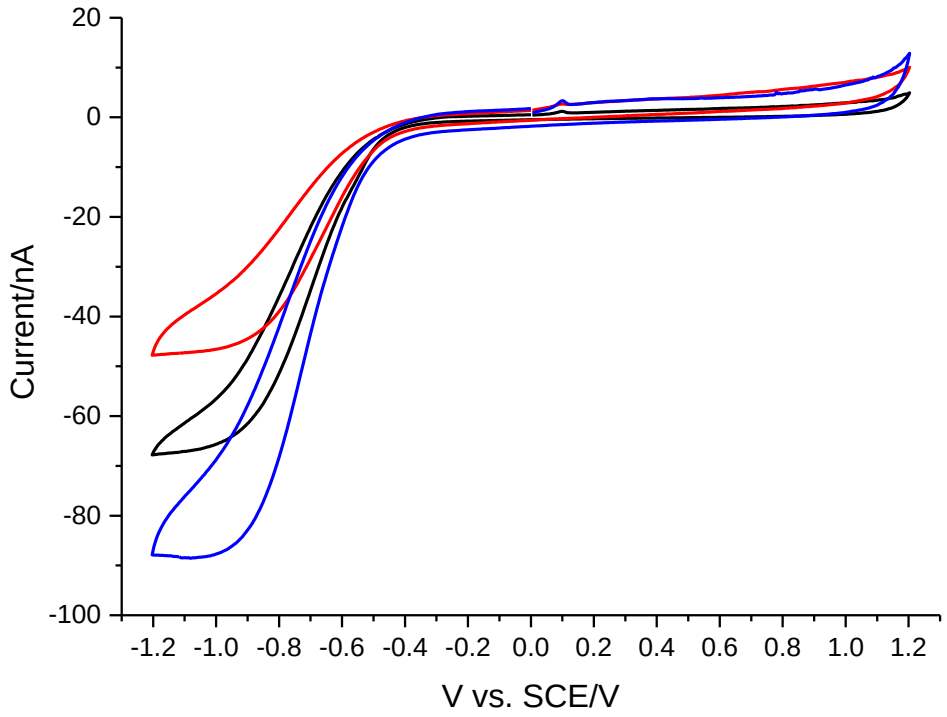


Figure S5: The voltammetric response of a cylindrical carbon fibre wire electrode in supporting electrolyte (0.1M KCl, 50 mM potassium monophosphate, 50 mM potassium diphosphate) recorded as a function of scan rates (25 mV $s^{-1}$, red line; 50 mV $s^{-1}$, black line; 100 mV $s^{-1}$, blue line). The reduction current likely indicates 50 µM of oxygen in the solution due to limitations of degassing.

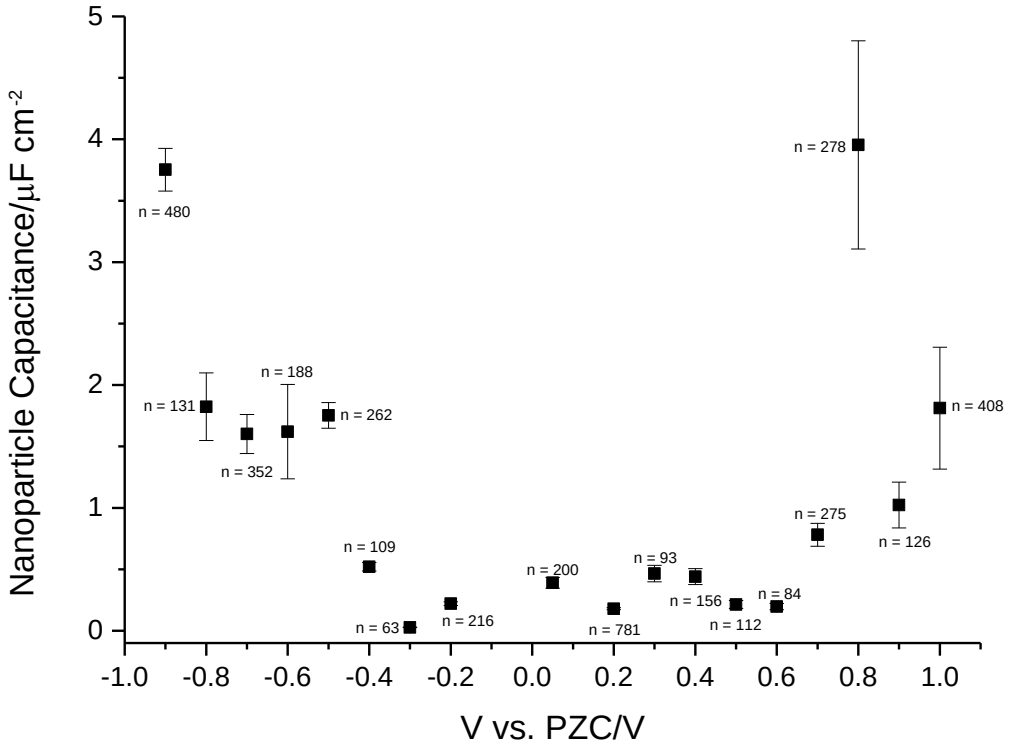


Figure S6: Plot of nanoparticle capacitance vs. PZC in 5.91 × $10^{-13}$ mol $dm^{-3}$ suspension. The plot shows a non-linear relationship of potential (vs. PZC) to nanoparticle capacitance. The n numbers shows the number of impacts involved in generating each data point and error bars.