

Supporting Information

Comparing the Effect of Different Surfactants on the Aggregation and Electrical Contact Properties of Graphene Nanoplatelets

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Section 1

Table S1 A review of surfactants for exfoliating graphite and related materials to produce and stabilise graphene nanoplatelets (GNPs) using sonication method in water based solution

Surfactants	Pristine Materials	References
Sodium dodecylbenzene sulfonate (SDBS)	Graphite powder	[1]
Pyrene-1SO ₃	Graphite powder	[2, 3]
Pyrene-4SO ₃	Graphite powder	[2, 4]
Pyridinium tribromide (Py ⁺ Br ³⁻)	HOPG	[5]
Pyrene-NH ₂	Graphite powder	[4]
Diazaperopyrenium dication (MP ²⁺)	Graphite powder	[6]
poly(methyl methacrylate) (PMMA)	Graphite nanoplatelets	[7]
polyvinylpyrrolidone (PVP)	Graphite powder	[8]
Poly(ethylene glycol)	Graphite powder	[9]
Sodium cholate	Graphite powder	[10-12]

Surfactants	Pristine Materials	References
sodium dodecylbenzene sulfonate (SDBS)	Graphite powder	[12, 13]
Cetyl Trimethylammonium bromide (CTAB)	Graphite powder	[14]
Hexadecyltrimethylammonium bromide (HTAB)	Graphite powder	[14]
Triton X-100	Graphite powder	[12, 15]
Brij 30	Graphite powder	[14]
n-Dodecyl β -d-maltoside (BDBM)	Graphite powder	[14]

Section 2: Supporting Figures

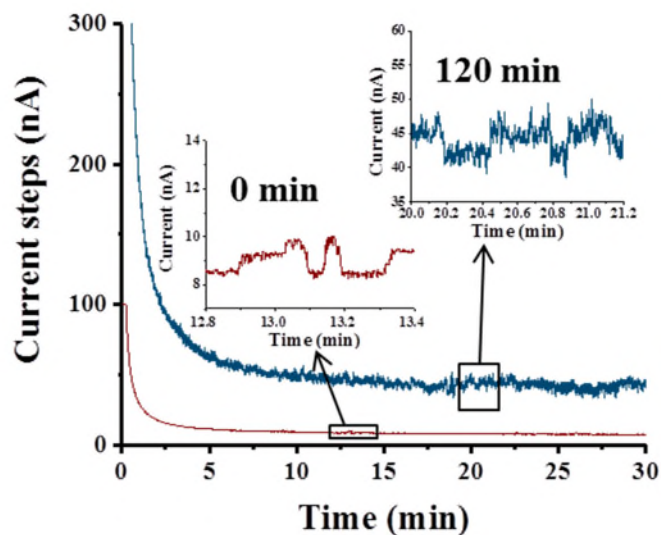


Figure S1 (a) Chronoamperometric profiles of IDE-Au immersed in a 5.95×10^{-15} mol. dm^3 GNPs suspension at different aging time (—a fresh solution and —after GNPs are aged in the solution for 2h) at a potential 0.8V and inset images show the zoom-in images of the chronoamperometric profiles and (b) Bright-field optical microscopic images of GNPs in DI water solution (5.95×10^{-15} mol. dm^3) subjected to 10 min sonication, (b) 0 min and (c) 2 hour after sonication process

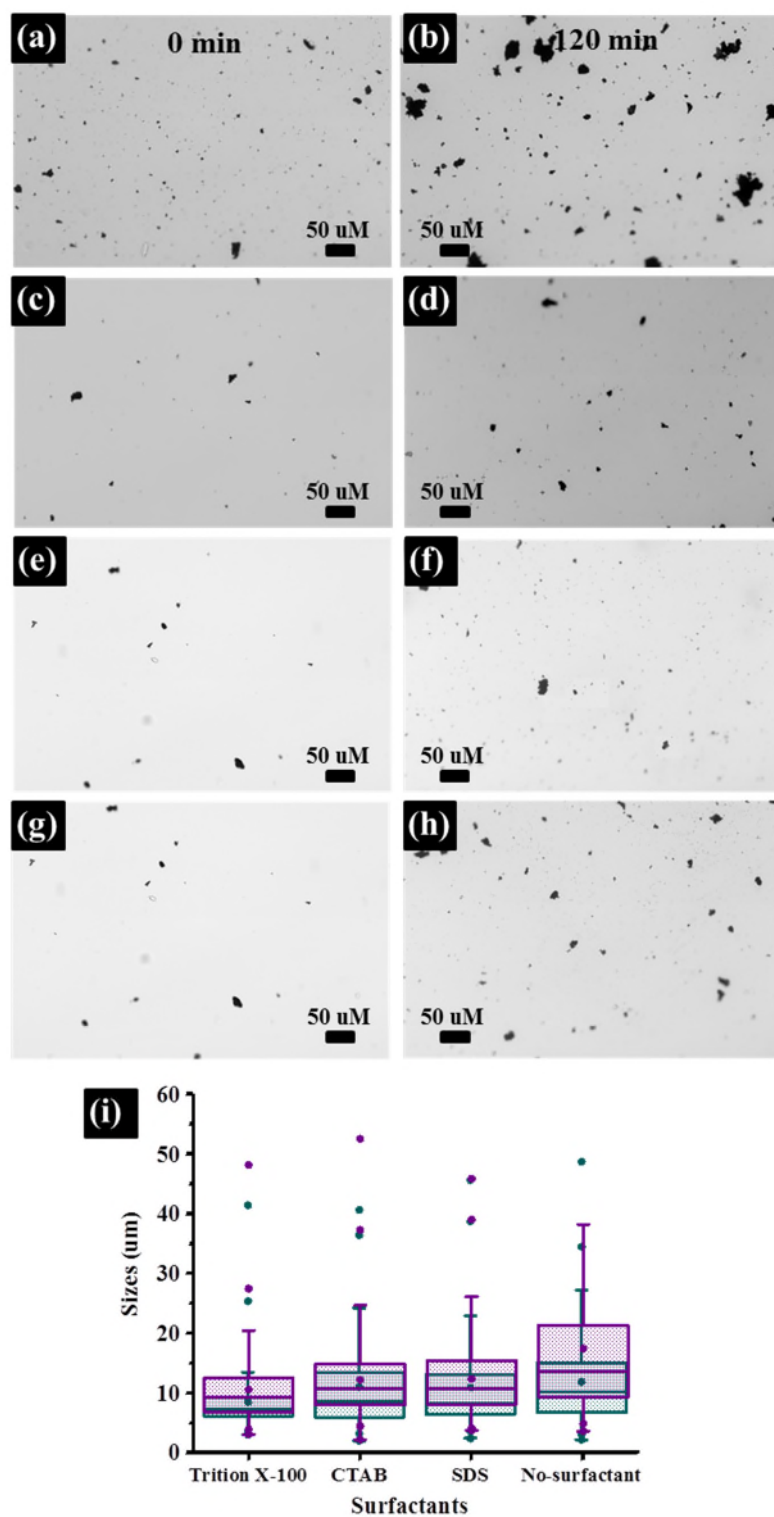


Figure S2 Bright-field optical microscopic images of 5.95×10^{-15} mol. dm^3 GNPs in DI water solution containing different surfactants ((a, b) absence surfactant, (c, d) 10 μ M Triton X-100, (e, f) 10 μ M CTAB, and (g, h) 10 μ M SDS) Note: (a, c, e, g) 0 min, and (b, d, f, h) 2 hour after

sonication process), and (i) box-plot comparisons particle size of with and without surfactants (pink color represents 0 min and purple color represents after aging for 2 hour).

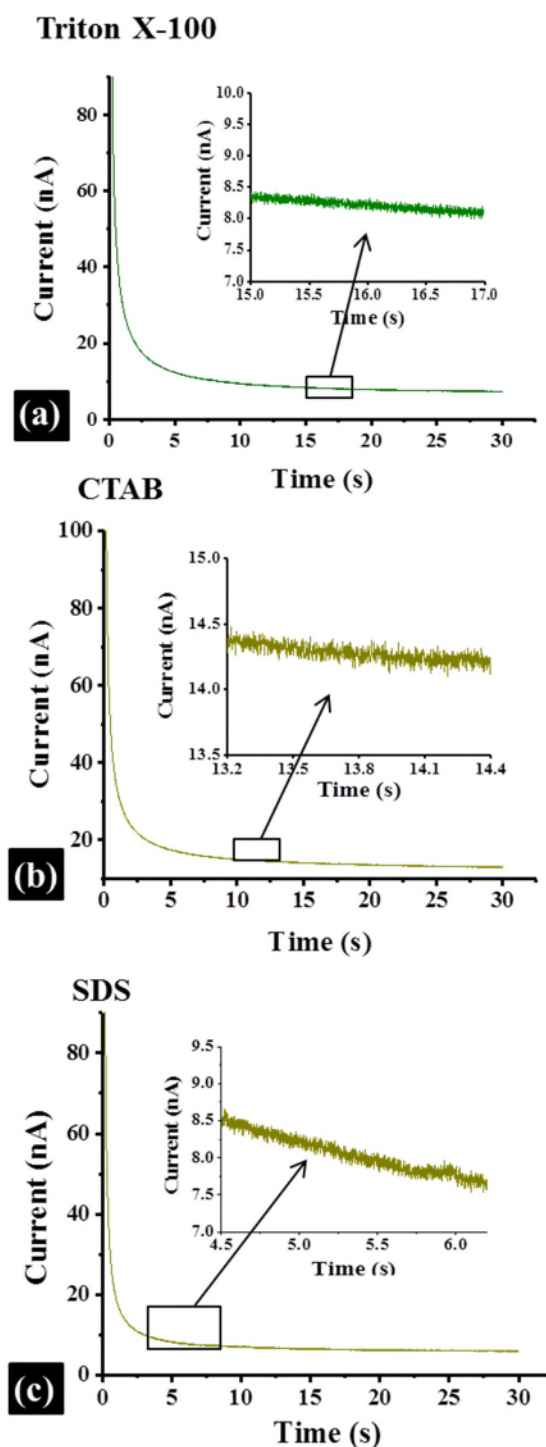


Figure S3. Chronoamperometric profiles of IDE-Au immersed in a 5.95×10^{-15} mol. dm^3 GNPs suspension containing (a) 15 μM Triton X-100, (b) 25 μM CTAB and (c) 25 μM SDS at 0.8V

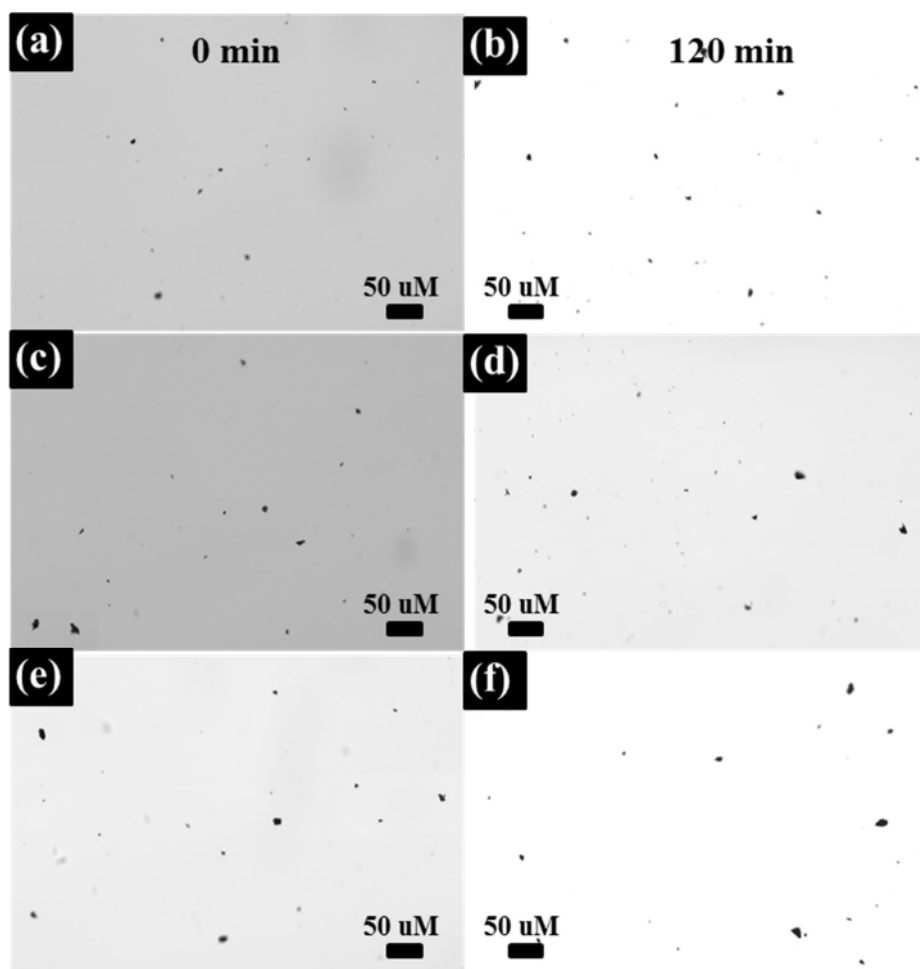


Figure S4 Bright-field optical microscopic images of $5.95 \times 10^{-15} \text{ mol. dm}^3$ GNPs in DI water solution containing 25 uM of different surfactants ((a, b) Triton X-100, (c, d) CTAB, and (e, f) SDS) Note: (a, c, e) 0 min and (b) 2 hour after sonication process)

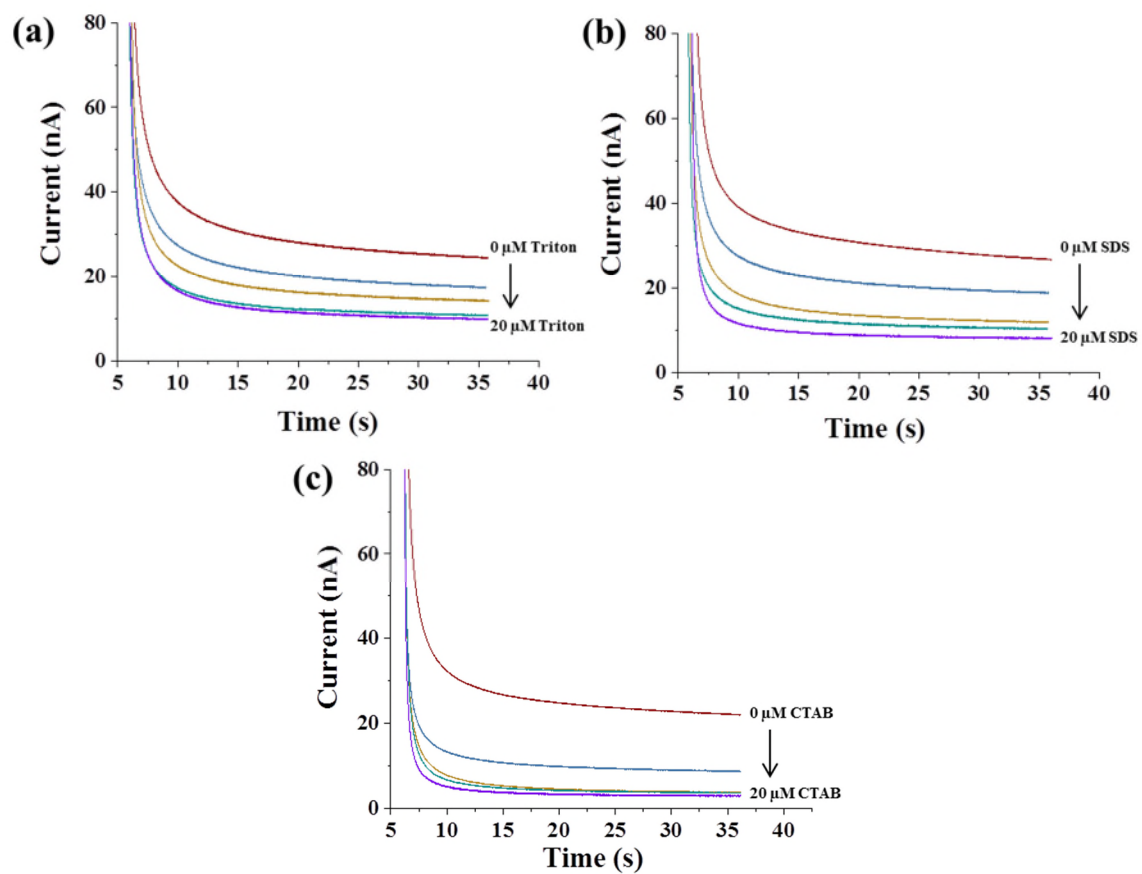


Figure S5 Chronoamperometric profiles of IDE-Au in different concentrations (0-20 μM) of surfactants (a) Triton X-100, (b) CTAB and (c) SDS at 0.8V.

References

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