Electronic Supplementary Material (ESI) for Analyst.

Electronic Supporting information for:

Quantitative Characterisation of Conductive Fibers by Capacitive Coupling

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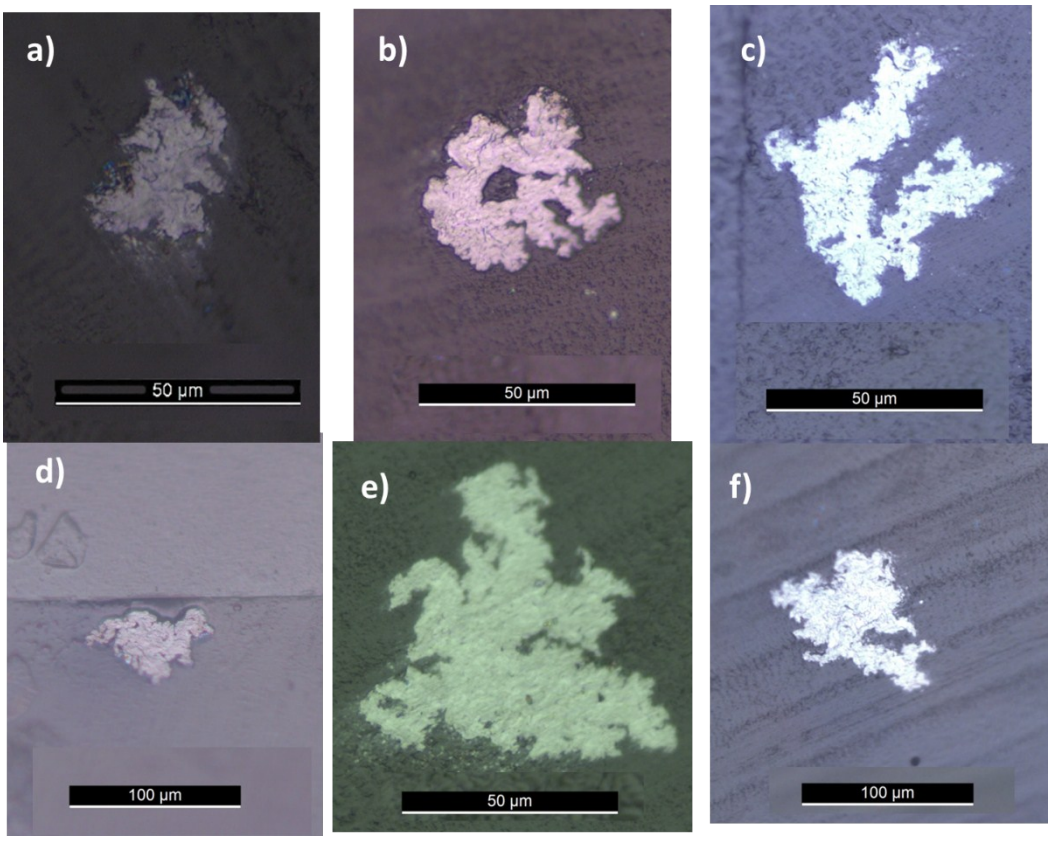

Figure S1. Optical microscope photographs displaying cross-sectional images of the RGO used in this study. From smaller to larger cross-section areas; a) F6, b)F5, c)F4, d)F3, e)F2, f)F1.

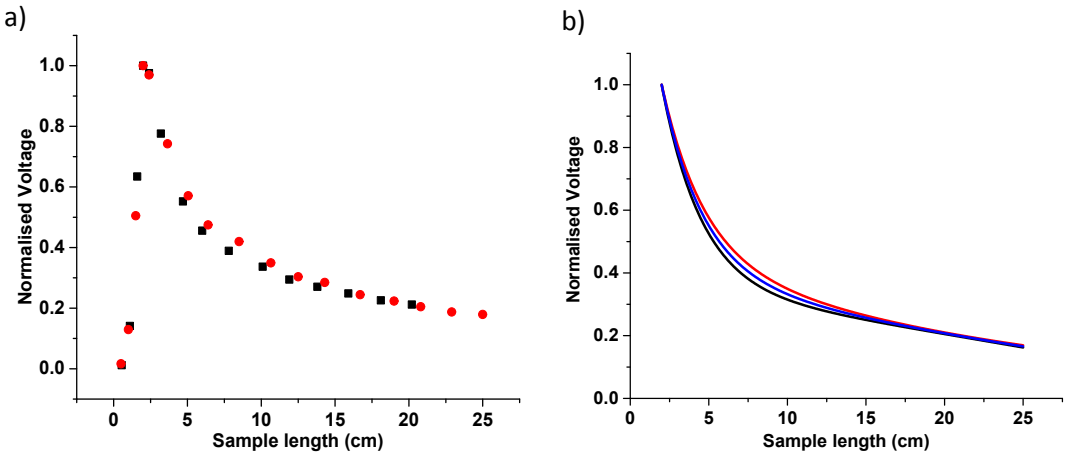

Figure S2. (a) Normalised comparison voltage output of F2 (circles) and F5 (squares). (b) Comparison of the fitting functions for F2 (red), F5 (black) and their average (blue). The bi-exponential fitting function used was: $y= A_1 \cdot \exp(-x/t_1) + A_2 \cdot \exp(-x/t_2) + y_0$

Table S1. Extracted fitting coefficients from fiber length dependence done in air measurements.

	F1	**F2**	**F5**	**SS**
y0	0.506	0.420	0.265	0.097
A1	2.654 (59 %)	0.992 (43 %)	2.101 (62 %)	0.916 (59 %)
T1	3.596	7.798	4.310	8.397
A2	1.773 (41 %)	1.294 (57 %)	1.301 (38 %)	0.647 (41 %)
T2	21.429	25.770	22.663	49.564

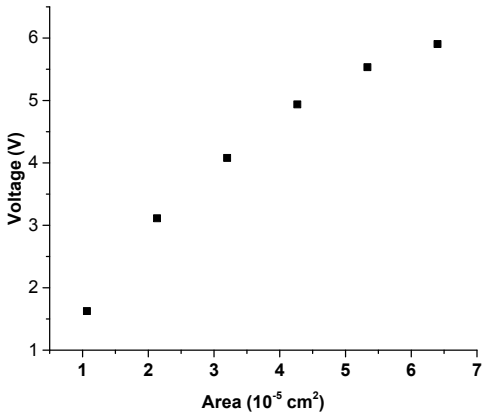

Figure S3. Voltage output as a function of F5 area. X-axis is recalculated from the number of fiber fragments based on a fiber of cross-sectional area of $1.06 \cdot 10^{-5}$ cm^2.

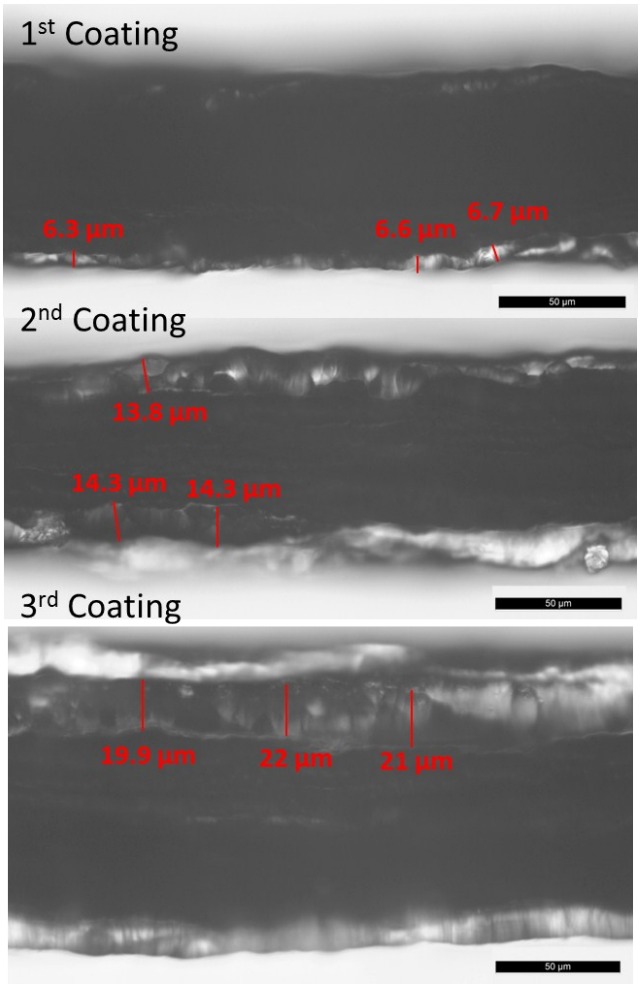

Figure S4. Optical microscope images of lateral sections from Parylene coated RGO fibers, batch F3, resulting from the different coating cycles.

Table S2. Summary of Parylene coated fibers, with the C4D voltage output as a function of coating cycle.

Coating Cycle	**Parylene thickness (µm)**	**Voltage (V) at 2 MHz**
0	0	1.83
1	6.3	1.83
2	14.3	1.85
3	20.9	1.84

Table S3. List of measured voltages (exp.) and estimated capacitances derived from the factor extracted from fiber F5.

Sample	**Voltage (exp.)**	**C_c (factor)**
F1	2.05	0.239
F2	1.94	0.227
F3	1.83	0.214
F4	1.76	0.206
F5	1.63	0.191
F6	1.52	0.178

Table S4. Regression coefficients for voltage output as a function of fiber resistance. $V = a \cdot \log(R) + b$, R in Ohms·cm.

Fiber	**a**	**b**
F1	-1.677	10.693
F2	-1.50745	9.68143
F6	-1.345	8.706