

## Platinum deposition on functionalised graphene for corrosion resistant oxygen reduction electrodes

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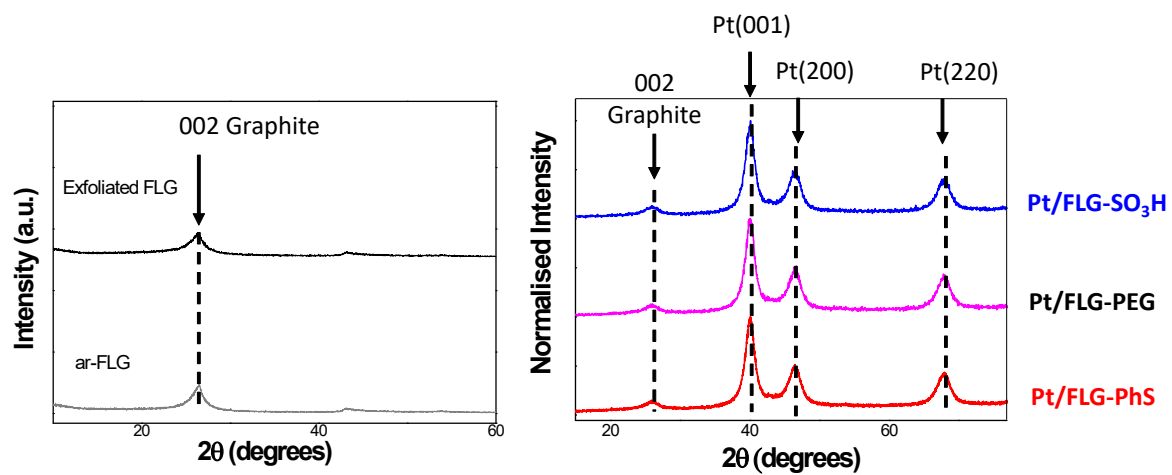


Figure S1. XRD patterns of as-received and exfoliated FLG (left panel) and the different modified graphenes (right panel).

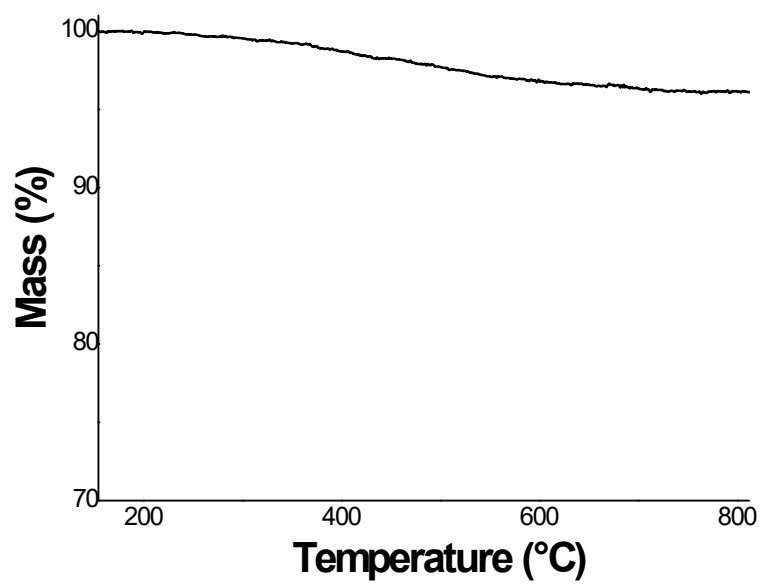


Figure S2. Thermogram under N<sub>2</sub> showing the degradation profile of as-received FLG material.

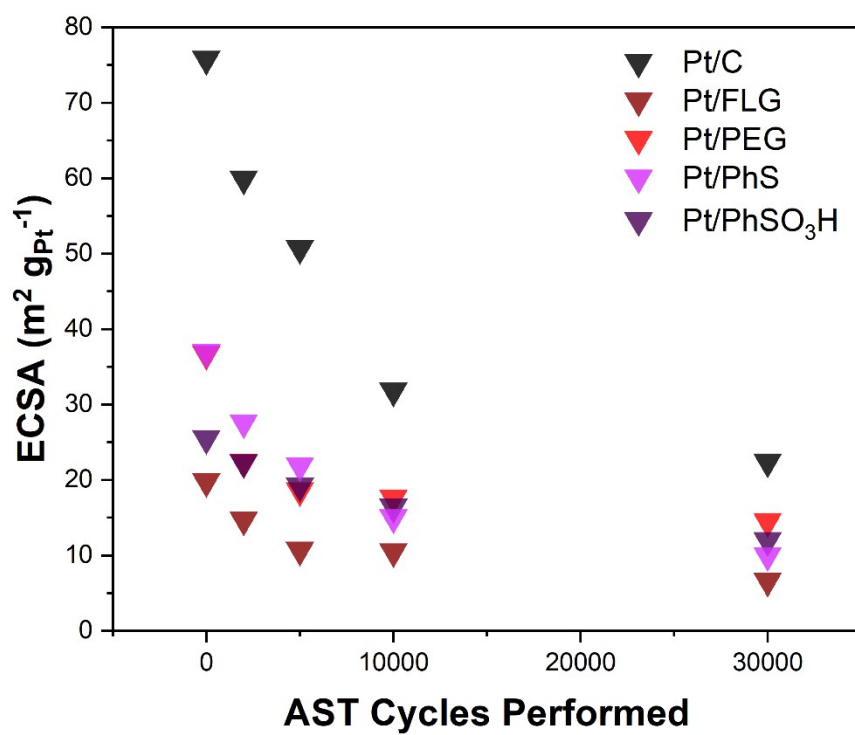


Figure S3. Graph comparing ECSA value change during durability testing of the different functionalised graphenes.

Table S1. Half wave potential voltage for each material during the AST experiments.

Half wave potential (V)	Sample				
Cycles	Pt/FLG	Pt/FLG-PEG	Pt/FLG-PhSO <sub>3</sub> H	Pt/FLG-Ph-S	Pt/C
0	0.613	0.705	0.712	0.725	0.731
2000	0.606	0.677	0.627	0.711	0.662
5000	0.569	0.667	0.583	0.658	0.651
10,000	0.557	0.631	0.539	0.582	0.538
30,000	0.229	0.457	0.363	0.324	0.289

Table S2. Diffusion current at 0.4 V for each material during the AST experiments.

Diffusion current at 0.4V (mA cm <sup>-2</sup> )	Sample				
Cycles	Pt/FLG	Pt/FLG-PEG	Pt/FLG-PhSO <sub>3</sub> H	Pt/FLG-Ph-S	Pt/C
0	5.40	5.55	5.60	5.48	6.63
2000	5.08	5.38	5.34	5.25	6.43
5000	4.9	5.44	5.60	4.85	6.29
10,000	4.88	5.15	5.4	4.58	5.47
30,000	3.85	4.73	5.34	4.16	5.34

Table S3. Kinetic current at 0.9V for each material during the AST experiments.

Kinetic current at 0.9V (mA cm <sup>-2</sup> )	Sample				
	Pt/FLG	Pt/FLG-PEG	Pt/FLG-PhSO <sub>3</sub> H	Pt/FLG-Ph-S	Pt/C
0	0.02916	0.06925	0.09395	0.10259	0.18101
2000	0.02886	0.05986	0.08565	0.05967	0.81723
5000	0.02563	0.05077	0.04852	0.04909	0.15755
10,000	0.02422	0.04662	0.04599	0.03253	0.09937
30,000	0.01153	0.02685	0.0401	0.02545	0.05007

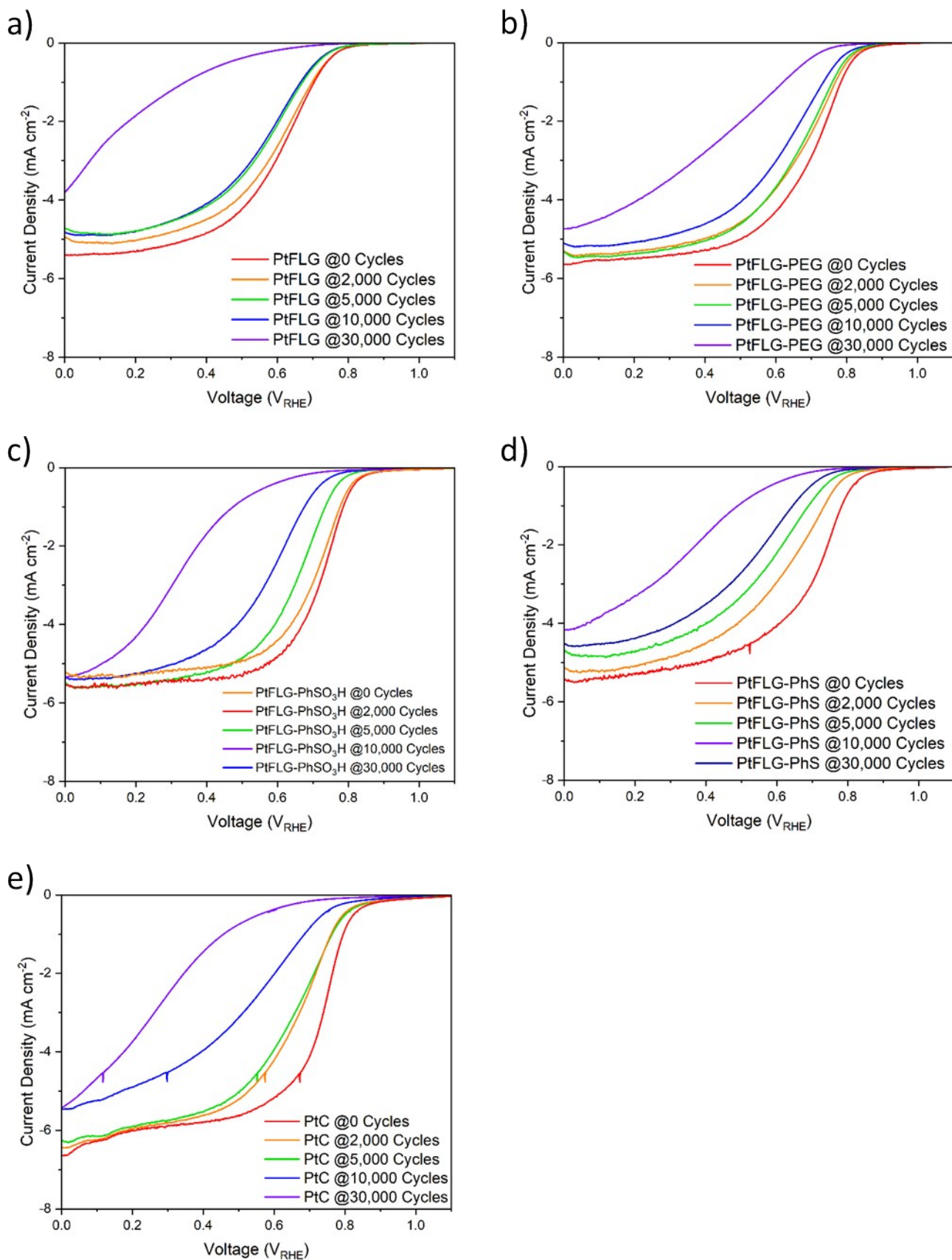


Figure S4. LSVs for every material at each stage of the AST

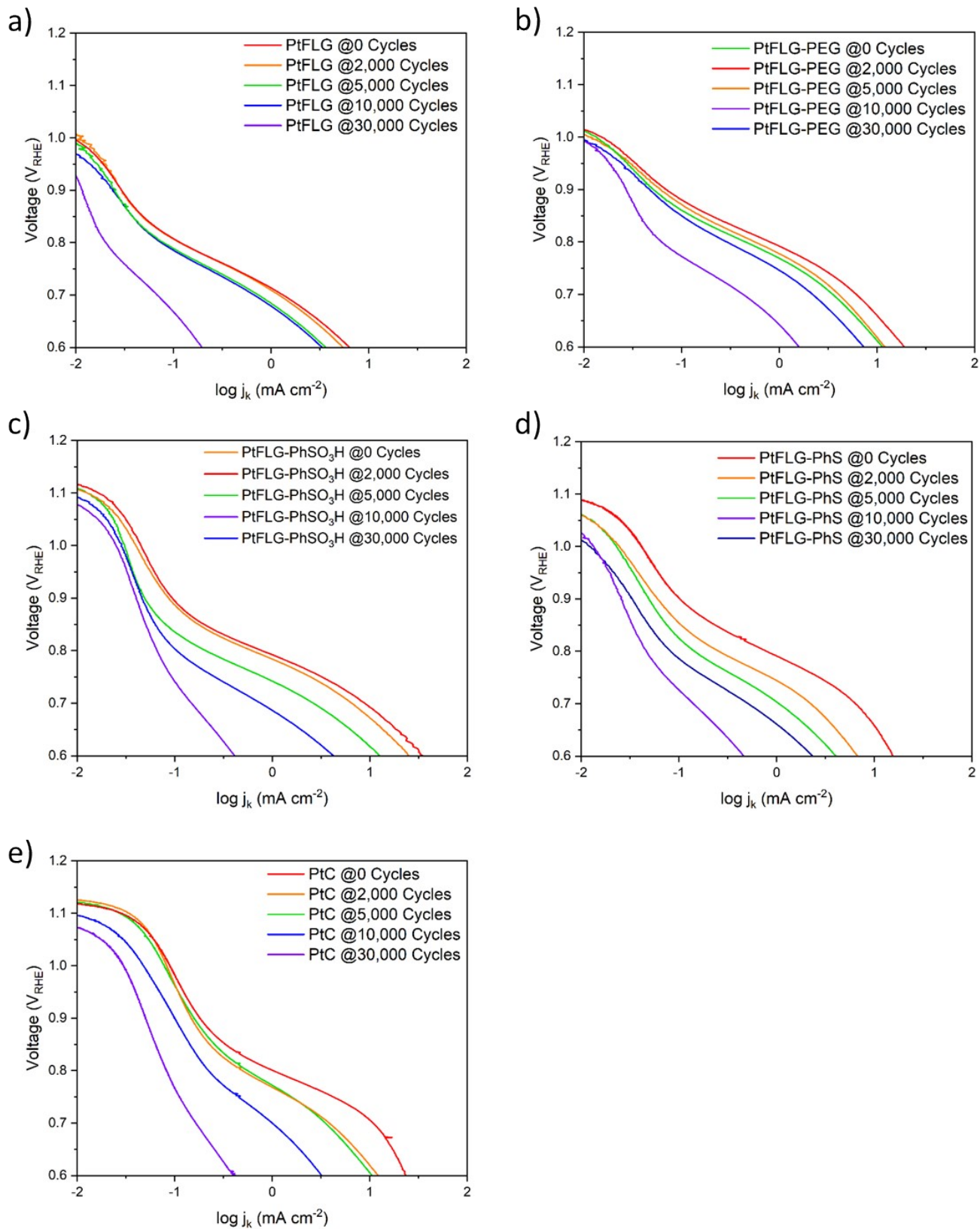


Figure S5. Tafel plots for every material at each stage of the AST