

Certain methods of electrode pretreatment create
misleading responses in impedimetric aptamer
biosensors

(Supplementary Information)

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Table S1. Mean and variance (standard deviation) obtained for the modelled parameters (Warburg impedance, double-layer capacitance and charge-transfer resistance) of the equivalent electrical circuit, for all the tested surfaces and pretreatments

Surface	Pre-treatment	Modelled parameters from impedance spectra						
		R_s (Ω)	C_{dl} (μF)	R_{ct} (Ω)	C_f (μF)	R_f (Ω)	W modulus (mMho)	χ^2
Au	Mechanical	179 ± 19	1.1 ± 0.5	197 ± 88	0.7 ± 0.2	133 ± 103	0.831 ± 0.082	0.021 ± 0.015
	Chemical	172 ± 16	0.7 ± 0.4	224 ± 181	0.8 ± 0.4	139 ± 80	0.977 ± 0.138	0.037 ± 0.026
	Electrochemical (acidic)	131 ± 79	0.4 ± 0.2	463 ± 269	3.5 ± 7.4	496 ± 367	0.890 ± 0.140	0.074 ± 0.043
	Combined (acidic)	174 ± 16	0.3 ± 0.3	564 ± 635	0.3 ± 0.1	1868 ± 1935	0.850 ± 0.145	0.076 ± 0.067
	Combined (alkaline)	181 ± 16	1.3 ± 0.7	178 ± 103	1.3 ± 1.2	126 ± 70	1.033 ± 0.093	0.016 ± 0.010
MPA	Mechanical	188 ± 31	1.3 ± 0.3	458 ± 130	1.1 ± 0.5	259 ± 113	0.958 ± 0.052	0.031 ± 0.013
	Chemical	180 ± 21	1.2 ± 0.3	718 ± 277	0.9 ± 0.2	254 ± 91	0.877 ± 0.069	0.030 ± 0.016
	Electrochemical (acidic)	188 ± 20	1.4 ± 0.4	648 ± 227	0.7 ± 0.2	329 ± 227	0.869 ± 0.076	0.045 ± 0.021
	Combined (acidic)	195 ± 25	0.9 ± 0.3	841 ± 522	0.9 ± 0.1	182 ± 80	0.835 ± 0.038	0.015 ± 0.007
	Combined (alkaline)	177 ± 19	1.4 ± 0.4	518 ± 159	1.2 ± 0.3	171 ± 84	0.903 ± 0.053	0.027 ± 0.017
SA	Mechanical	189 ± 16	1.6 ± 0.5	628 ± 142	0.6 ± 0.1	465 ± 137	0.911 ± 0.049	0.047 ± 0.020
	Chemical	187 ± 19	1.6 ± 0.3	727 ± 166	0.6 ± 0.04	572 ± 141	0.892 ± 0.056	0.056 ± 0.013
	Electrochemical (acidic)	193 ± 22	2.7 ± 2.7	468 ± 259	1.5 ± 2.0	477 ± 357	0.865 ± 0.073	0.034 ± 0.021
	Combined (acidic)	191 ± 26	7.1 ± 9.7	564 ± 365	1.1 ± 0.3	182 ± 128	0.879 ± 0.070	0.036 ± 0.012
	Combined (alkaline)	199 ± 22	1.0 ± 0.2	1444 ± 150	1.2 ± 0.3	247 ± 42	0.792 ± 0.060	0.044 ± 0.015
APT	Mechanical	182 ± 24	1.3 ± 0.6	773 ± 342	0.7 ± 0.2	366 ± 200	0.867 ± 0.065	0.048 ± 0.034
	Chemical	183 ± 21	1.5 ± 0.4	686 ± 321	1.1 ± 0.5	340 ± 179	0.870 ± 0.044	0.064 ± 0.027
	Electrochemical (acidic)	187 ± 21	0.9 ± 0.1	2007 ± 689	1.4 ± 0.3	160 ± 60	0.762 ± 0.080	0.051 ± 0.007
	Combined (acidic)	190 ± 23	1.0 ± 0.2	2323 ± 994	1.8 ± 0.2	134 ± 29	0.723 ± 0.074	0.055 ± 0.011
	Combined (alkaline)	190 ± 24	0.9 ± 0.2	2056 ± 422	1.2 ± 0.2	245 ± 42	0.815 ± 0.039	0.053 ± 0.010

Surface	Pre-treatment	Modelled parameters from impedance spectra						
		R_s (Ω)	C_{dl} (μF)	R_{ct} (Ω)	C_f (μF)	R_f (Ω)	W modulus (mMho)	χ^2
THR	Mechanical	172 ± 15	0.9 ± 0.2	2521 ± 437	2.2 ± 0.4	102 ± 39	0.811 ± 0.083	0.032 ± 0.008
	Chemical	193 ± 29	0.8 ± 0.3	3023 ± 1251	1.5 ± 0.2	180 ± 61	0.747 ± 0.078	0.045 ± 0.010
	Electrochemical (acidic)	192 ± 24	0.9 ± 0.2	1194 ± 710	1.0 ± 0.2	410 ± 547	0.869 ± 0.056	0.056 ± 0.015
	Combined (acidic)	181 ± 20	0.8 ± 0.3	3560 ± 1557	1.6 ± 0.5	118 ± 17	0.726 ± 0.150	0.050 ± 0.017
	Combined (alkaline)	183 ± 18	1.0 ± 0.2	3426 ± 683	1.9 ± 0.4	130 ± 70	0.778 ± 0.092	0.045 ± 0.012