

Supporting Information

TiO₂/polydopamine multilayer nanocomposite with exceptionally sharp large-scale interfaces and nitrogen doping gradient

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Table S1. X-Ray photoelectron spectroscopy deep profiles, Atomic percentage and binding energies of the elements for etching times 0, 3, 21, 36 and 53 min.

Etching time (min)	Element	Binding Energy (eV)	Atomic %
0	Ti	458.83	0.3
	C	284.83	70.1
	N	400.13	6.6
	O	532.98	21.0
	Si	101.93	1.0
3	Ti	459.41	0.9
	C	284.71	89.0
	N	399.21	5.6
	O	531.11	3.8
	Si	-	-
21	Ti	459.28	4.5
	C	284.73	80.4
	N	398.98	3.6
	O	531.18	11.6
	Si	-	-
37	Ti	460.67	22.6
	C	286.07	25.5
	N	398.27	2.4
	O	532.42	45.5
	Si	103.77	2.6
53	Ti	460.09	28.7
	C	286.89	9.9
	N	399.19	1.9
	O	533.09	59.6
	Si	-	-

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Table S2. X-ray photoelectron spectroscopy deep profiles- area percentage, binding energies and FWHM values for C 1s, O 1s regions for etching times 0, 3, 21, 36 and 53 min. Additionally, the N 1s region for times 0 and 3 min was shown (not shown in Table 1)

Etching time (min)	High resolution region	Binding Energy (eV)	FWHM	Area %
0	C 1s	290.19	3.85	2.7
		288.31	1.81	7.0
		286.18	1.64	43.9
		285.21	0.76	7.3
		284.68	1.08	39.1
	N 1s	401.81	2.32	25.5
		400.09	1.85	73.0
		398.67	0.79	1.53
	O 1s	533.02	1.78	69.8
		531.49	1.88	30.2
3	C 1s	289.88	1.71	0.7
		287.95	2.49	4.5
		285.79	2.16	26.8
		285.10	1.47	40.1
		284.59	1.01	28.0
	N 1s	402.31	1.86	4.8
		400.38	1.57	33.2
		398.95	1.71	62.1
	O 1s	532.66	2.44	50.6
		531.04	1.34	49.4
21	C 1s	290.59	2.07	1.6
		288.51	2.25	4.1
		286.25	2.49	20.6
		285.16	1.67	44.8
		284.63	1.02	29.0
	O 1s	532.50	2.49	39.0
531.15		1.38	61.0	
36	C 1s	288.72	1.87	3.5
		287.22	1.62	18.5
		286.03	1.42	64.8
		284.62	1.25	13.1
	O 1s	533.19	1.89	37.7
532.32		1.19	62.3	
53	C 1s	288.33	1.77	13.4
		286.90	1.63	61.0
		284.80	1.16	25.6
	O 1s	534.06	2.08	36.8
		533.09	1.23	63.2

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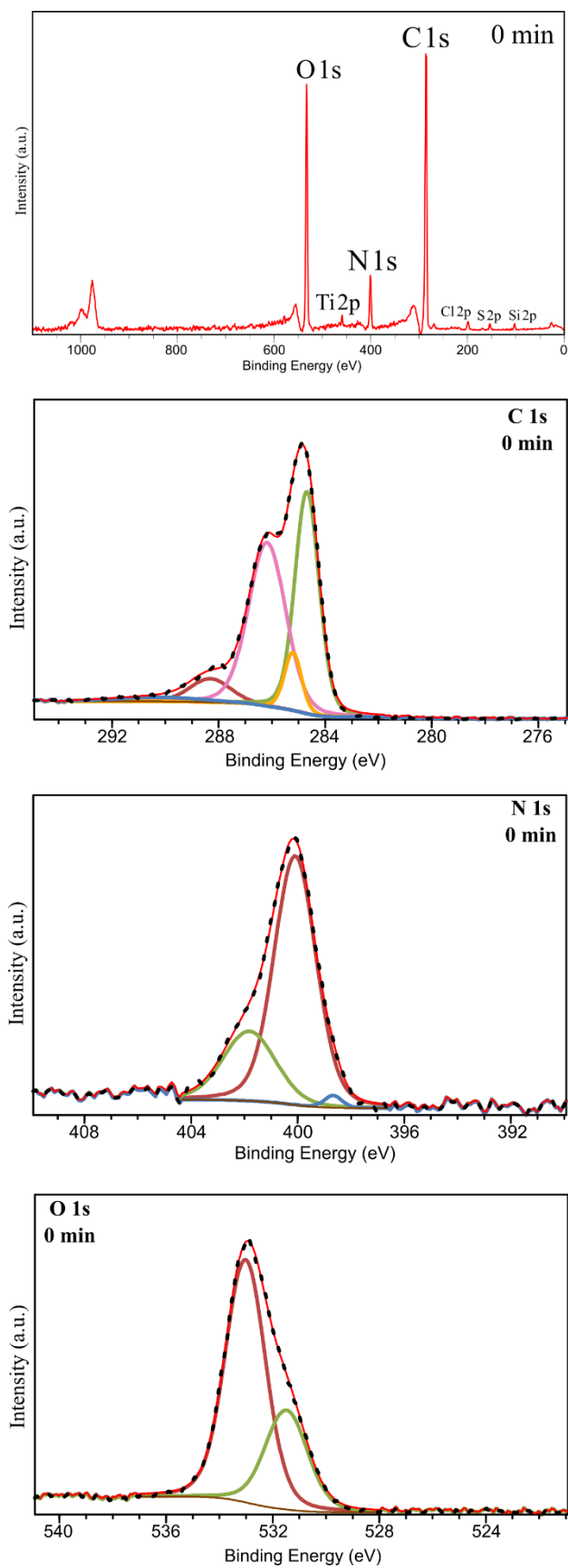


Figure S1. X-ray Photoelectron Full spectra and High-Resolution Spectra of the C 1s, N 1s and O 1s regions for etching time 0 min.

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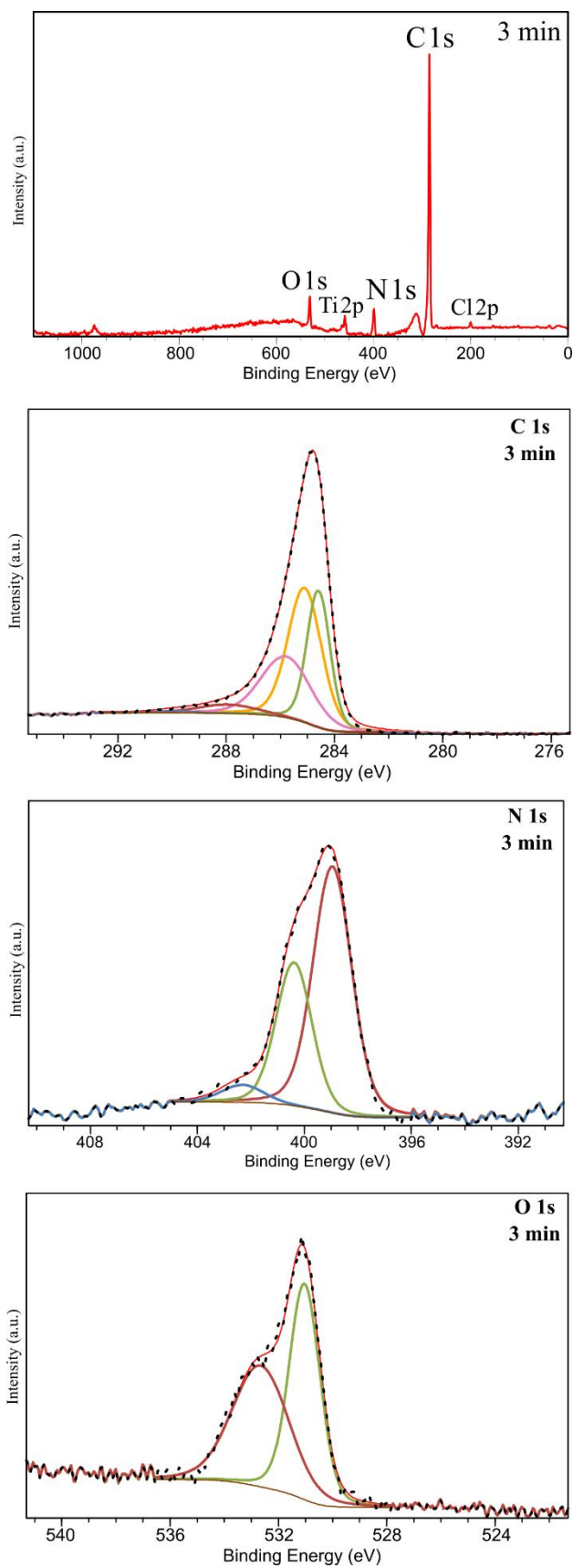


Figure S2. X-ray Photoelectron Full spectra and High-Resolution Spectra of the C 1s, N 1s and O 1s regions for etching time 3 min.

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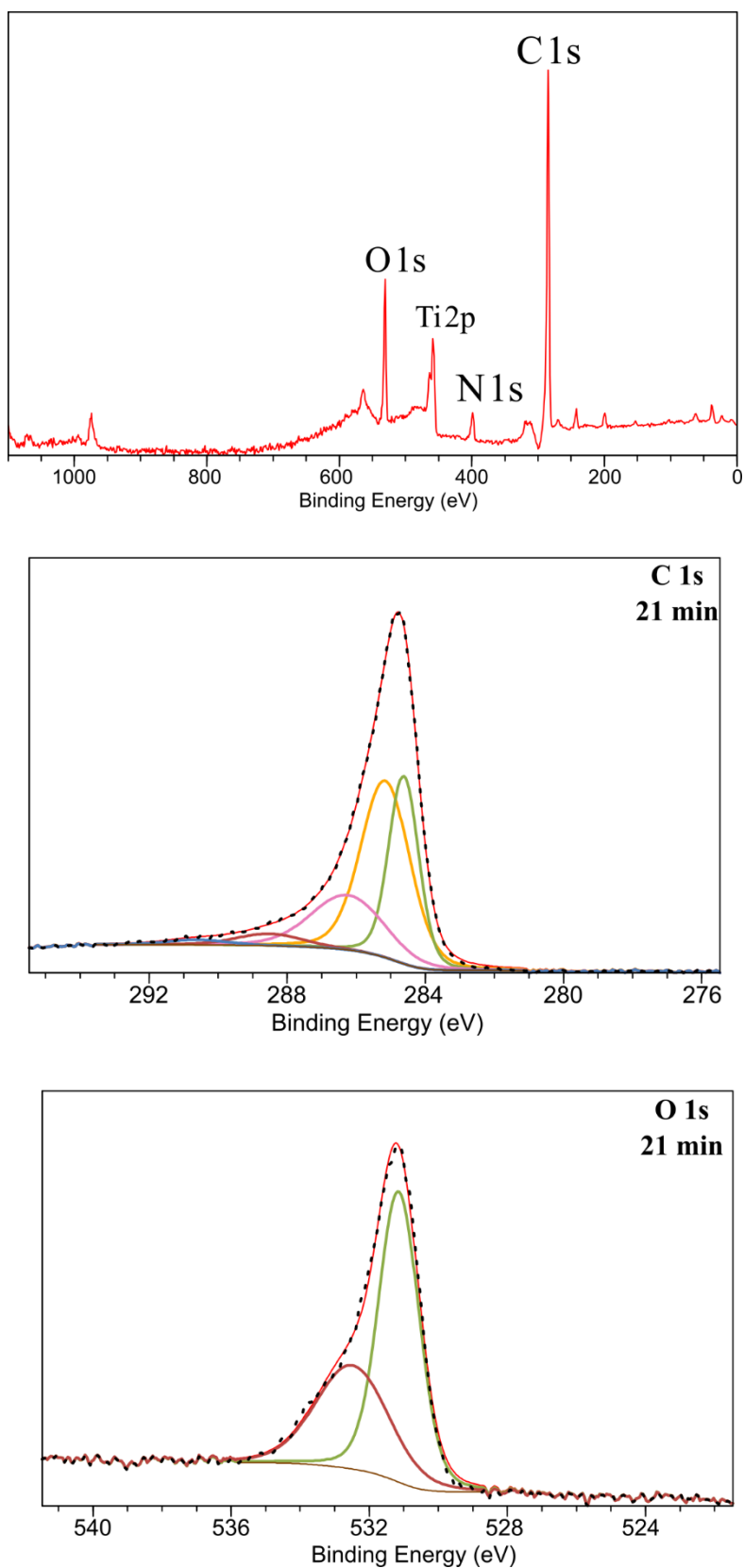


Figure S3. X-ray Photoelectron Full spectra and High-Resolution Spectra of the C 1s and O 1s regions for etching time 21 min.

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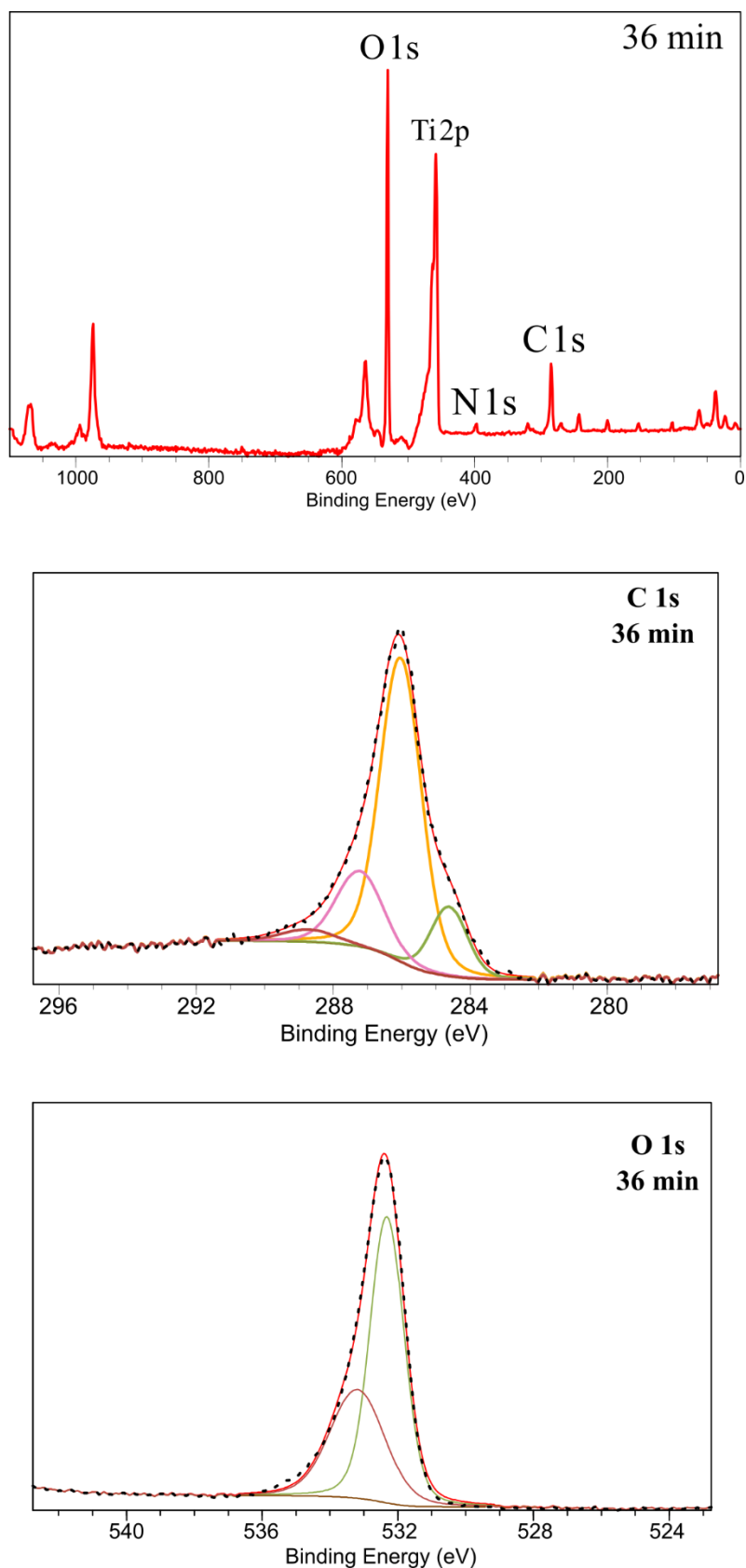


Figure S4. X-ray Photoelectron Full spectra and High-Resolution Spectra of the C 1s and O 1s regions for etching time 36 min.

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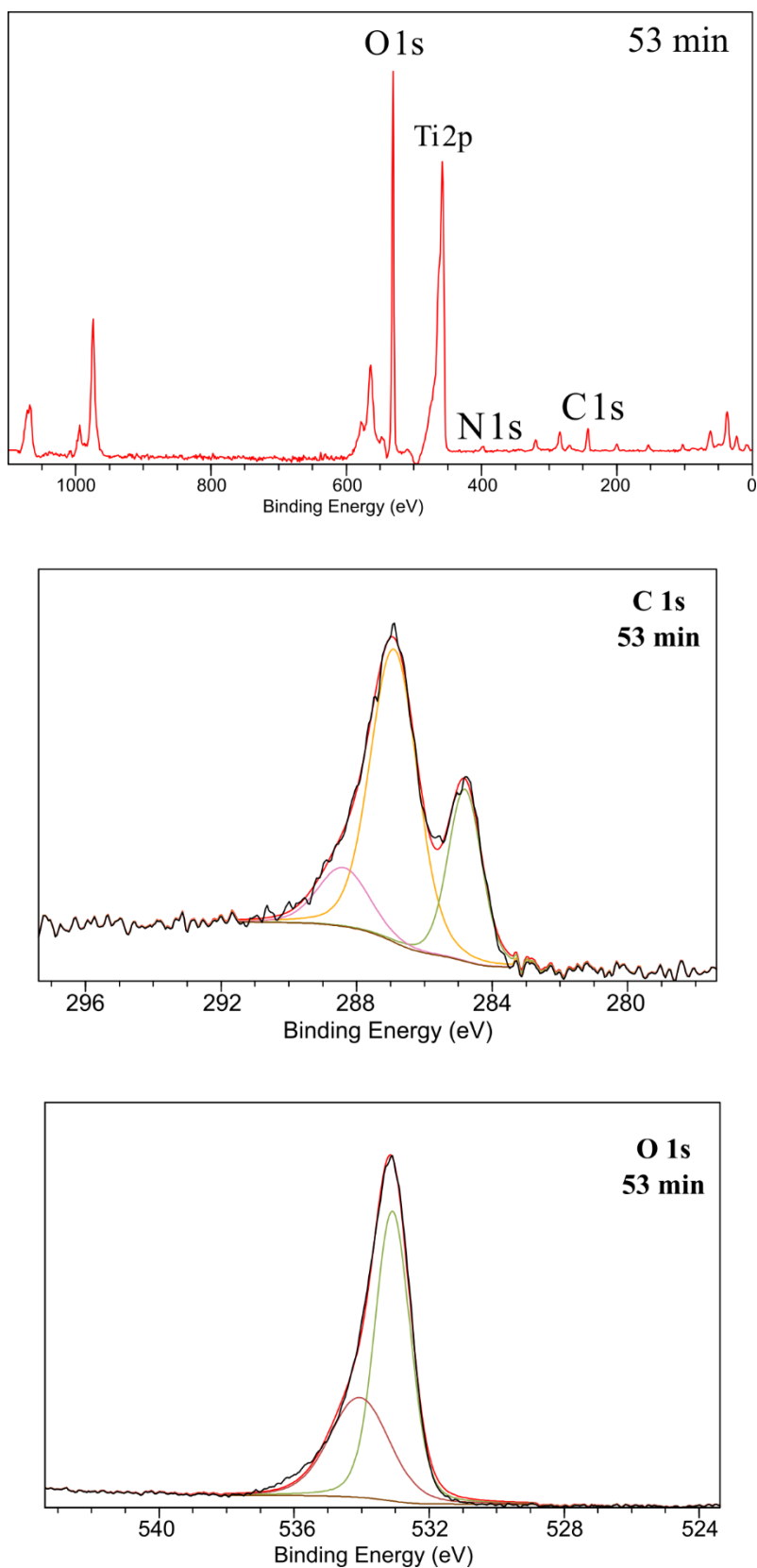


Figure S5. X-ray Photoelectron Full spectra and High-Resolution Spectra of the C 1s and O 1s regions for etching time 53 min.

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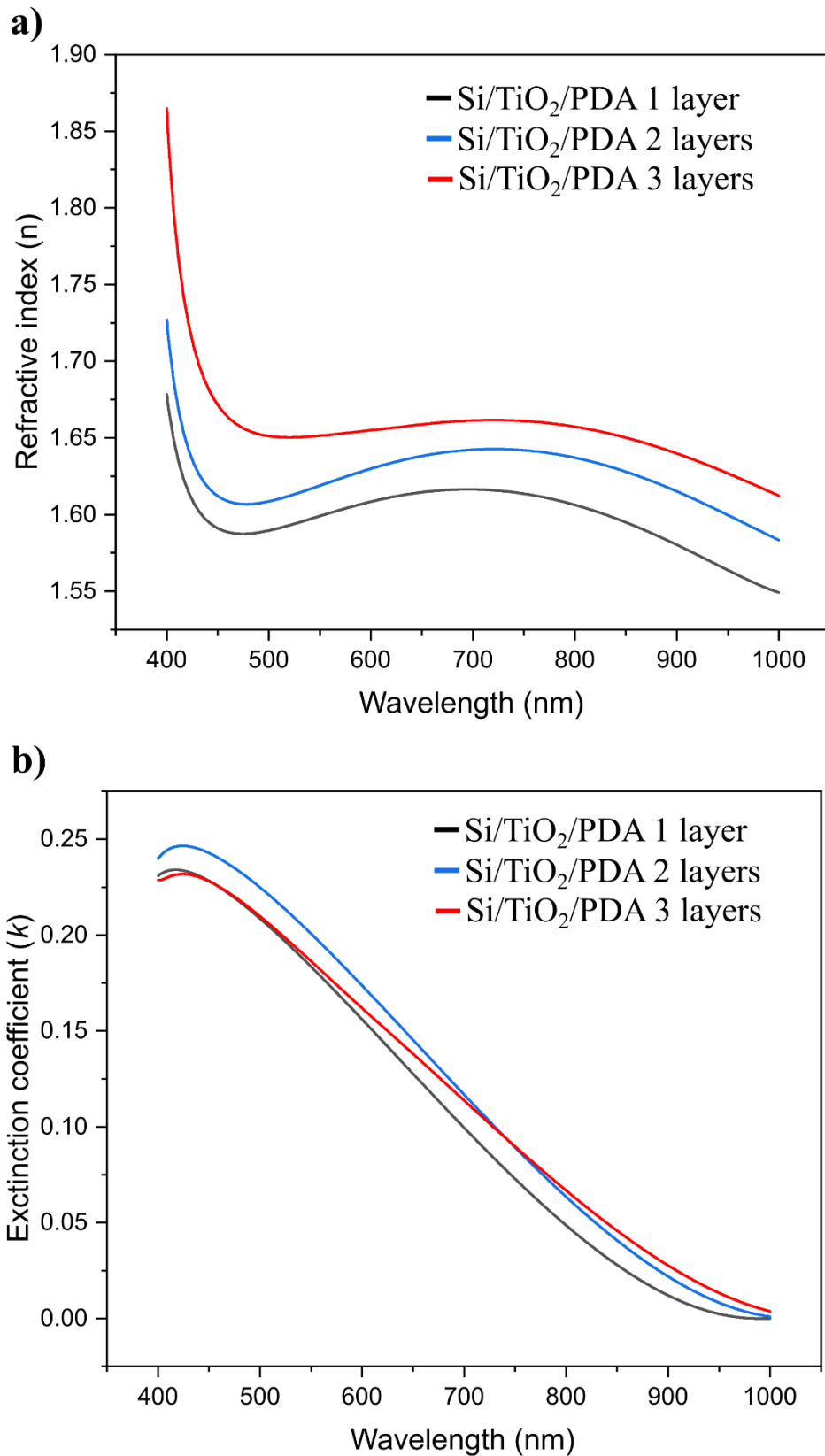


Figure S6. The real part of the refractive index (a), the extinction coefficient (b) for the PDA layers measured with ellipsometry.

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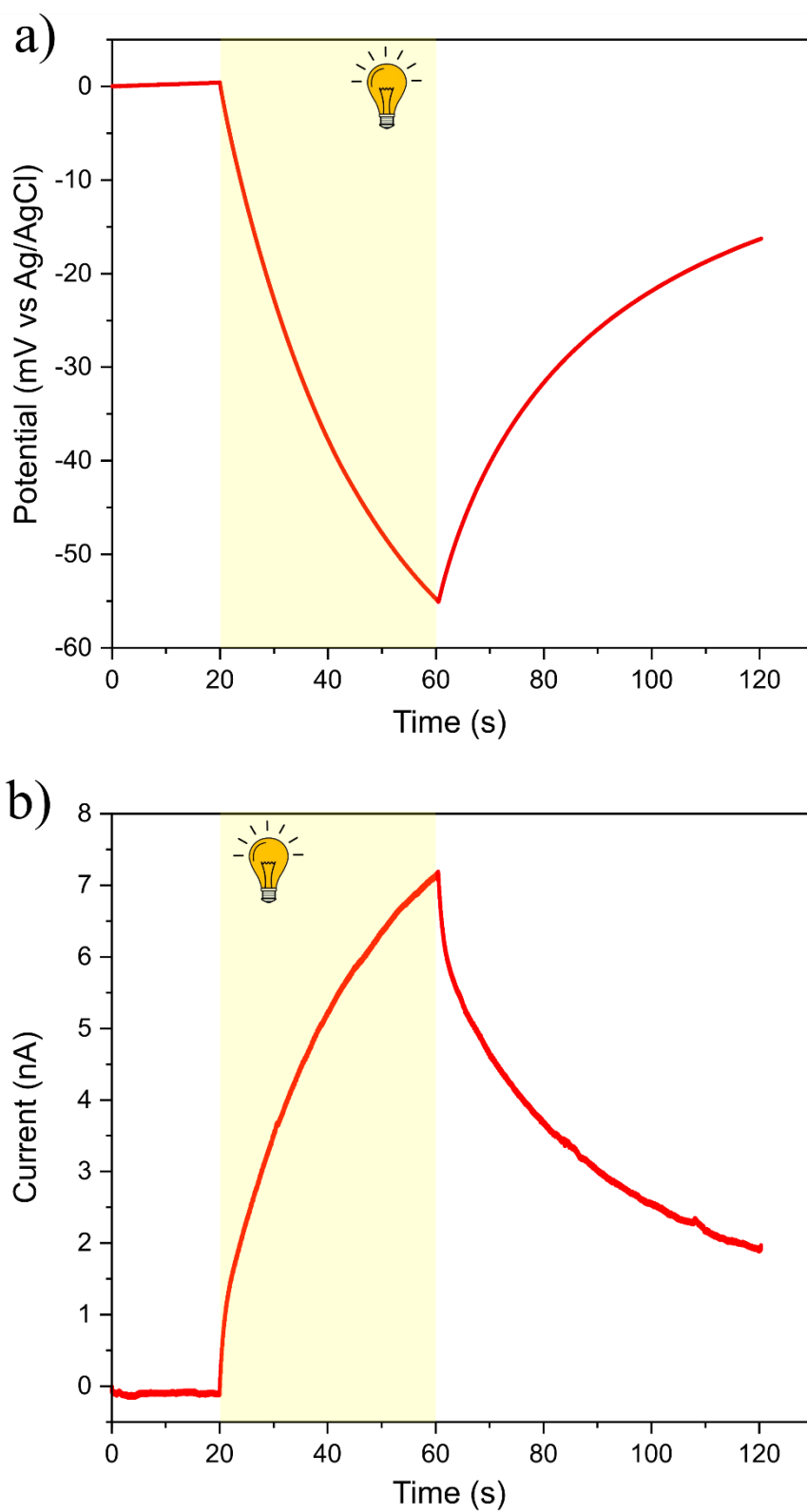


Figure S7. Open Circuit Photopotential (a), Open Circuit Photocurrent (b) curves for 3-layer nanocomposite.