Supplementary Materials

Effects of TiO_2 nanoparticles on the overall performance and corrosion protection ability of neat epoxy and PDMS modified epoxy coating systems

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Table. S1. Fitted values of the equivalent circuit elements along with the equivalent circuit model used to fit the EIS data for E coating system and all epoxy – TiO_2 nanocomposite coatings after 1 day of immersion time.

System	R_{po} (Ω cm^2)	CPR_{po}		R_{ct} (Ω cm^2)	CPE_{dl}		R_{diff} (Ω cm^2)	CPE_{diff}		Model used
		Y_0 (Ω^{-1} cm^{-2} s^n)	n		Y_0 (Ω^{-1} cm^{-2} s^n)	n		Y_0 (Ω^{-1} cm^{-2} s^n)	n	
E	$(9.00 \pm 0.17) \times 10^3$	$(1.07 \pm 0.01) \times 10^{-6}$	0.78	$(4.31 \pm 0.07) \times 10^4$	$(1.49 \pm 0.15) \times 10^{-7}$	1.00	$(4.79 \pm 0.04) \times 10^5$	$(7.67 \pm 0.13) \times 10^{-8}$	0.86	B
ET1	$(2.02 \pm 0.15) \times 10^9$	$(8.34 \pm 0.03) \times 10^{-10}$	0.98	$(3.91 \pm 0.04) \times 10^{10}$	$(2.27 \pm 0.06) \times 10^{-10}$	0.93	-	-	-	A
ET2	$(5.30 \pm 0.08) \times 10^8$	$(2.18 \pm 0.12) \times 10^{-9}$	0.98	$(1.06 \pm 0.06) \times 10^9$	$(1.59 \pm 0.04) \times 10^{-10}$	0.62	-	-	-	A
ET3	$(3.78 \pm 0.06) \times 10^8$	$(2.39 \pm 0.06) \times 10^{-9}$	0.99	$(1.43 \pm 0.04) \times 10^9$	$(2.36 \pm 0.04) \times 10^{-10}$	0.79	-	-	-	A

Table. S2. Fitted values of the equivalent circuit elements along with the equivalent circuit model used to fit the EIS data for E coating system and all epoxy – TiO_2 nanocomposite coatings after 30 days of immersion time.

System	R_{po} (Ω cm^2)	CPR_{po}		R_{ct} (Ω cm^2)	CPE_{dl}		R_{diff} (Ω cm^2)	CPE_{diff}		Model used
		Y_0 (Ω^{-1} cm^{-2} s^n)	n		Y_0 (Ω^{-1} cm^{-2} s^n)	n		Y_0 (Ω^{-1} cm^{-2} s^n)	n	
E	$(1.57 \pm 0.29) \times 10^3$	$(8.22 \pm 0.14) \times 10^{-5}$	0.42	$(4.41 \pm 0.33) \times 10^3$	$(2.57 \pm 0.21) \times 10^{-5}$	0.72	$(9.70 \pm 0.16) \times 10^4$	$(3.23 \pm 0.38) \times 10^{-7}$	0.53	B
ET1	$(2.97 \pm 0.02) \times 10^8$	$(3.26 \pm 0.07) \times 10^{-9}$	0.96	$(2.90 \pm 0.08) \times 10^9$	$(7.57 \pm 0.16) \times 10^{-10}$	0.83	-	-	-	A
ET2	$(3.31 \pm 0.04) \times 10^5$	$(2.01 \pm 0.04) \times 10^{-6}$	0.95	$(4.23 \pm 0.13) \times 10^5$	$(1.02 \pm 0.07) \times 10^{-7}$	0.52	$(5.54 \pm 0.06) \times 10^6$	$(5.70 \pm 0.13) \times 10^{-7}$	0.70	B
ET3	$(1.48 \pm 0.05) \times 10^4$	$(3.32 \pm 0.34) \times 10^{-5}$	0.96	$(6.55 \pm 0.09) \times 10^4$	$(7.66 \pm 0.17) \times 10^{-6}$	0.66	$(6.62 \pm 0.07) \times 10^5$	$(4.54 \pm 0.15) \times 10^{-6}$	0.71	B

Table. S3. Fitted values of the equivalent circuit elements along with the equivalent circuit model used to fit the EIS data for E, EP coating systems and all PDMS modified epoxy – TiO_2 nanocomposite coatings after 1 day of immersion time.

System	R_{po} (Ω cm^2)	CPR_{po}		R_{ct} (Ω cm^2)	CPE_{dl}		R_{diff} (Ω cm^2)	CPE_{diff}		Model used
		Y_0 (Ω^{-1} cm^{-2} s^n)	n		Y_0 (Ω^{-1} cm^{-2} s^n)	n		Y_0 (Ω^{-1} cm^{-2} s^n)	n	
E	$(9.00 \pm 0.17) \times 10^3$	$(1.07 \pm 0.01) \times 10^{-6}$	0.78	$(4.31 \pm 0.07) \times 10^4$	$(1.49 \pm 0.15) \times 10^{-7}$	1.00	$(4.79 \pm 0.04) \times 10^5$	$(7.67 \pm 0.13) \times 10^{-8}$	0.86	B
EP	$(4.12 \pm 0.06) \times 10^4$	$(4.15 \pm 0.02) \times 10^{-6}$	0.99	$(3.56 \pm 0.03) \times 10^6$	$(1.11 \pm 0.08) \times 10^{-8}$	0.96	-	-	-	A
ETP1	$(7.04 \pm 0.01) \times 10^9$	$(1.57 \pm 0.02) \times 10^{-10}$	0.97	$(2.44 \pm 0.07) \times 10^{10}$	$(0.73 \pm 0.01) \times 10^{-10}$	0.73	-	-	-	A
ETP2	$(9.43 \pm 0.27) \times 10^8$	$(8.49 \pm 0.07) \times 10^{-10}$	0.99	$(5.85 \pm 0.05) \times 10^9$	$(1.64 \pm 0.02) \times 10^{-10}$	0.91	-	-	-	A
ETP3	$(2.93 \pm 0.49) \times 10^7$	$(1.86 \pm 0.06) \times 10^{-9}$	0.78	$(3.91 \pm 0.02) \times 10^8$	$(3.41 \pm 0.03) \times 10^{-10}$	0.98	-	-	-	A

Table. S4. Fitted values of the equivalent circuit elements along with the equivalent circuit model used to fit the EIS data for E, EP coating systems and all PDMS modified epoxy – TiO_2 nanocomposite coatings after 30 days of immersion time.

System	R_{po} (Ω cm^2)	CPR_{po}		R_{ct} (Ω cm^2)	CPE_{dl}		R_{diff} (Ω cm^2)	CPE_{diff}		Model used
		Y_0 (Ω^{-1} cm^{-2} s^n)	n		Y_0 (Ω^{-1} cm^{-2} s^n)	n		Y_0 (Ω^{-1} cm^{-2} s^n)	n	
E	$(1.57 \pm 0.29) \times 10^3$	$(8.22 \pm 0.14) \times 10^{-5}$	0.42	$(4.41 \pm 0.33) \times 10^3$	$(2.57 \pm 0.21) \times 10^{-5}$	0.72	$(9.70 \pm 0.16) \times 10^4$	$(3.23 \pm 0.38) \times 10^{-7}$	0.53	B
EP	$(1.12 \pm 0.14) \times 10^4$	$(8.55 \pm 0.08) \times 10^{-6}$	0.94	$(4.01 \pm 0.25) \times 10^5$	$(9.01 \pm 0.08) \times 10^{-8}$	0.90	-	-	-	A
ET1	$(3.75 \pm 0.02) \times 10^7$	$(3.41 \pm 0.01) \times 10^{-9}$	0.88	$(7.13 \pm 0.06) \times 10^9$	$(2.27 \pm 0.05) \times 10^{-10}$	0.99	-	-	-	A
ETP2	$(5.26 \pm 0.12) \times 10^3$	$(2.32 \pm 0.41) \times 10^{-6}$	0.56	$(4.11 \pm 0.09) \times 10^5$	$(2.06 \pm 0.15) \times 10^{-7}$	0.98	$(1.72 \pm 0.23) \times 10^6$	$(1.77 \pm 0.13) \times 10^{-8}$	0.89	B
ETP3	$(6.65 \pm 0.36) \times 10^3$	$(7.40 \pm 0.19) \times 10^{-6}$	0.93	$(5.47 \pm 0.31) \times 10^4$	$(3.86 \pm 0.26) \times 10^{-7}$	0.73	$(3.25 \pm 0.07) \times 10^5$	$(2.54 \pm 0.33) \times 10^{-9}$	0.84	B