Table S1. The value of corrosion potential, corrosion current and corrosion inhibition rate for Gr_0-ZnO_0, $Gr_{0.04}$-ZNO_0, $Gr_{0.02}$-$ZnO_{0.4}$, $Gr_{0.04}$-$ZnO_{0.4}$ and $Gr_{0.06}$-$ZnO_{0.4}$ coatings in Tafel image.

Samples	E_{corr}/mV	i_{corr}/A cm^{-2}	η/%
Gr_0-ZnO_0	-631.36	9.40×10^{-6}	—
$Gr_{0.04}$-ZnO_0	-610.04	4.49×10^{-6}	52.23
$Gr_{0.02}$-$ZnO_{0.4}$	-599.13	5.67×10^{-7}	93.97
$Gr_{0.04}$-$ZnO_{0.4}$	-527.80	4.15×10^{-8}	99.56
$Gr_{0.06}$-$ZnO_{0.4}$	-560.74	8.89×10^{-7}	90.54

Table S2. The value of corrosion potential, corrosion current and corrosion inhibition rate of for $Gr_{0.04}$-ZnO_0, $Gr_{0.04}$-$ZnO_{0.1}$, $Gr_{0.04}$-$ZnO_{0.4}$ and $Gr_{0.04}$-ZnO_1 coatings in Tafel image.

Samples	E_{corr}/V	i_{corr}/A cm^{-2}	η/%
$Gr_{0.04}$-ZnO_0	-610.04	4.49×10^{-6}	52.23
$Gr_{0.04}$-$ZnO_{0.1}$	-561.78	4.07×10^{-7}	95.67
$Gr_{0.04}$-$ZnO_{0.4}$	-527.80	4.15×10^{-8}	99.56
$Gr_{0.04}$-ZnO_1	-547.32	3.52×10^{-7}	96.25

Table S3. Electrochemical parameters extracted from EIS experiment for Gr_0-ZnO_0, $Gr_{0.04}$-ZNO_0, $Gr_{0.02}$-$ZnO_{0.4}$, $Gr_{0.04}$-$ZnO_{0.4}$ and $Gr_{0.06}$-$ZnO_{0.4}$ coatings immersed in a 3.5wt% NaCl aqueous solution.

Samples	R_s (Ω cm^2)	C (Ω^{-1}cm^{-2}sn)	R_p (Ω cm^2)	Y_0 (Ω^{-1}cm^{-2}sn)	n
Gr_0-ZnO_0	249.1	5.64×10^{-7}	6186	8.95×10^{-4}	0.56

$Gr_{0.04}$-ZnO_0	344.1	6.3×10^{-7}	19560	1.07×10^{-5}	0.51
$Gr_{0.02}$-$ZnO_{0.4}$	211.1	8.50×10^{-6}	42096	1.15×10^{-5}	0.73
$Gr_{0.04}$-$ZnO_{0.4}$	494.4	9.56×10^{-5}	200530	9.19×10^{-7}	0.76
$Gr_{0.06}$-$ZnO_{0.4}$	284.3	1.22×10^{-6}	56695	3.15×10^{-6}	0.66

Table S4. Electrochemical parameters extracted from EIS experiment for $Gr_{0.04}$-ZnO_0, $Gr_{0.04}$-$ZnO_{0.1}$, $Gr_{0.04}$-$ZnO_{0.4}$ and $Gr_{0.04}$-ZnO_1 electrode immersed in a 3.5wt% NaCl aqueous solution.

Samples	R_s (Ω cm^2)	C	R_p (Ω cm^2)	Y_0 (Ω^{-1}cm^{-2}sn)	n
$Gr_{0.04}$-ZnO_0	344.1	6.3×10^{-7}	19560	1.07×10^{-5}	0.51
$Gr_{0.04}$-$ZnO_{0.1}$	503.3	5.06×10^{-7}	20018	4.21×10^{-6}	0.57
$Gr_{0.04}$-$ZnO_{0.4}$	494.4	9.56×10^{-5}	200530	9.19×10^{-7}	0.76
$Gr_{0.04}$-ZnO_1	333.2	4.17×10^{-6}	44914	8.14×10^{-6}	0.64

Table S5. Anticorrosion properties of graphene derivatives reinforced WEP.

Samples	Filler content (wt%)	Immersion duration in 3.5% NaCl (days)	Coating thickness (μm)	Rp (Ω cm^2)	CPEc (F)	Reference
$Gr_{0.04}$-$ZnO_{0.4}$	0.44	7	25 ± 2	2×10^5	9.56×10^{-5}	This Work
PGHEP-G	0.5	5	25 ± 0.5	2.5×10^4	unknown	31
G-CAT$^-$	0.5	4	20 ± 2	2.72×10^4	5.71×10^{-7}	32
Sodium polyacrylate graphene	0.5	2	50± 2	1.14×10^5	1.5×10^{-8}	33

lignin-OH/graphene	0.5	2	50 ± 5	2.8×10^{4}	7.6×10^{-10}	34
graphene/epoxy (GEP06)	0.6	3	20 ± 2	29.07	unknown	22

Table S6. The compositions of the investigated samples.

Samples	graphene (wt%)	ZnO (wt%)	Defoamer (wt%)	Waterborne epoxy dispersion (wt%)	Polyamide (wt%)
Gr_0-ZnO_0	0	0	1.1	66.7	32.2
$Gr_{0.02}$-$ZnO_{0.4}$	0.02	0.4	1.1	66.7	31.78
$Gr_{0.04}$-$ZnO_{0.4}$	0.04	0.4	1.1	66.7	31.76
$Gr_{0.06}$-$ZnO_{0.4}$	0.06	0.4	1.1	66.7	31.74
$Gr_{0.04}$-ZnO_0	0.04	0	1.1	66.7	32.16
$Gr_{0.04}$-$ZnO_{0.1}$	0.04	0.1	1.1	66.7	32.06
$Gr_{0.04}$-$ZnO_{0.4}$	0.04	0.4	1.1	66.7	32.06
$Gr_{0.04}$-ZnO_1	0.04	1	1.1	66.7	31.16

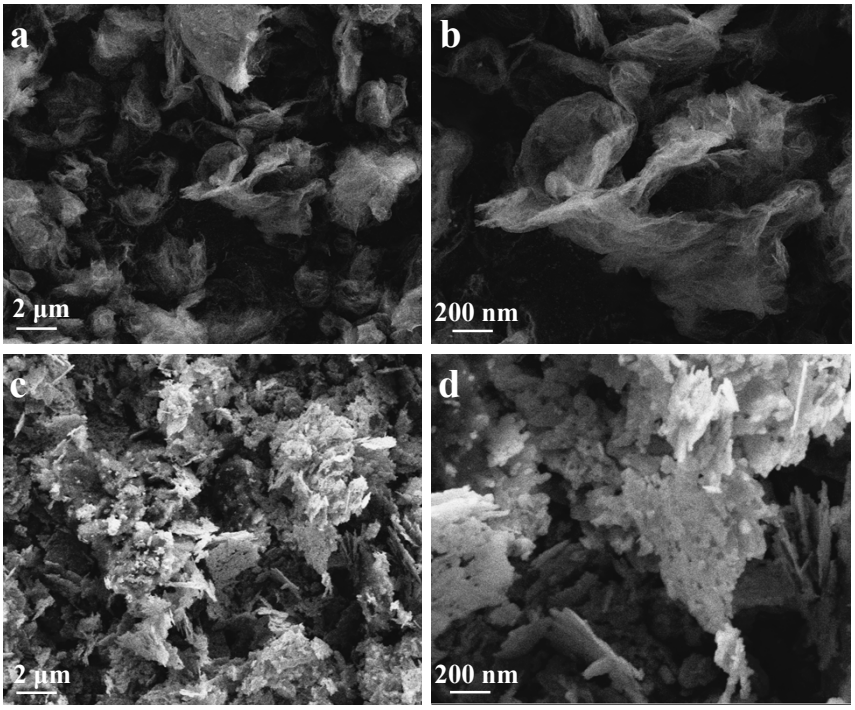

Figure S1. SEM of Gr (a,b), Gr/ZnO (c,d) samples.

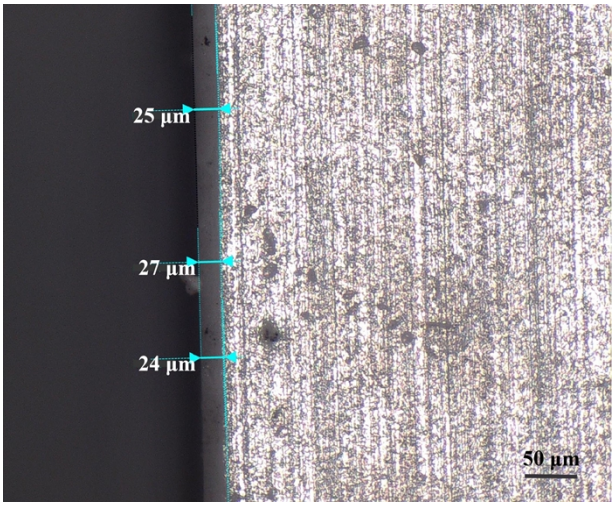

Figure S2. Optical microscope of $Gr_{0.04}$-$ZnO_{0.4}$ samples.

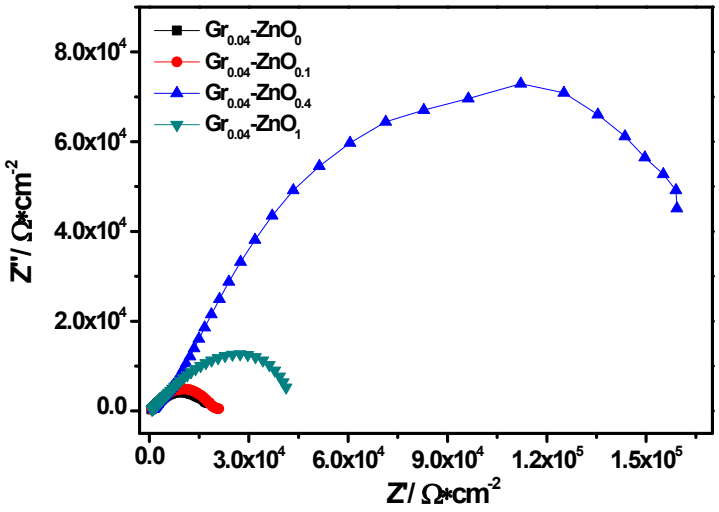

Figure S3. The Nyquist plots of $Gr_{0.04}$-ZnO_0, $Gr_{0.04}$-$ZnO_{0.1}$, $Gr_{0.04}$-$ZnO_{0.4}$ and $Gr_{0.04}$-ZnO_1.

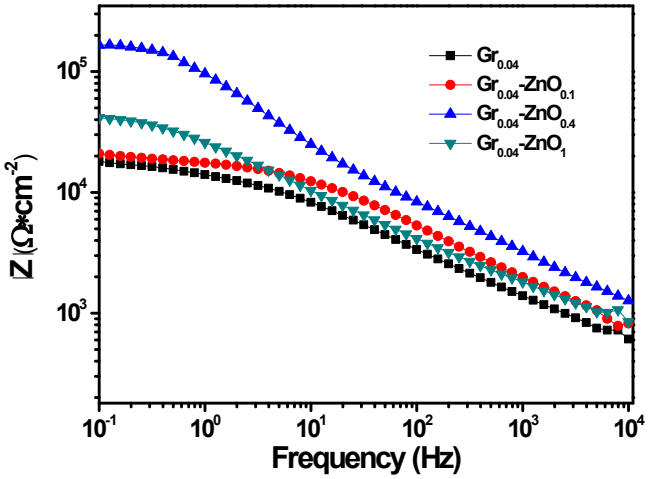

Figure S4. The Bode modulus plots of $Gr_{0.04}$-ZnO_0, $Gr_{0.04}$-$ZnO_{0.1}$, $Gr_{0.04}$-$ZnO_{0.4}$ and $Gr_{0.04}$-ZnO_1.

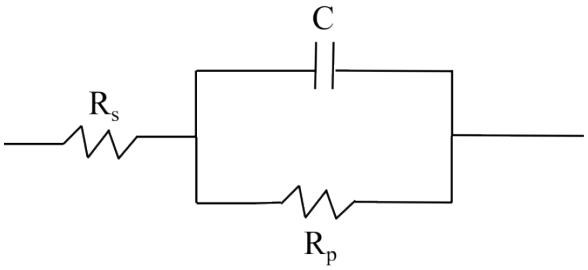

Figure S5. Equivalent electric circuits of the collected EIS results.

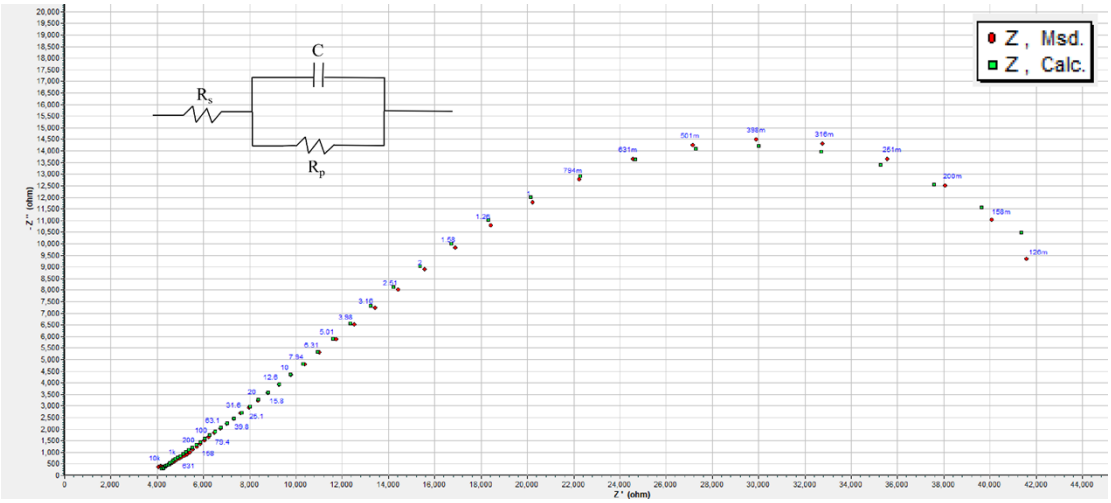

Figure S6. A typical Nyquist plots of $Gr_{0.02}$-$ZnO_{0.4}$ sample demonstrating the fitted and experimental data by ZSimpWin software.

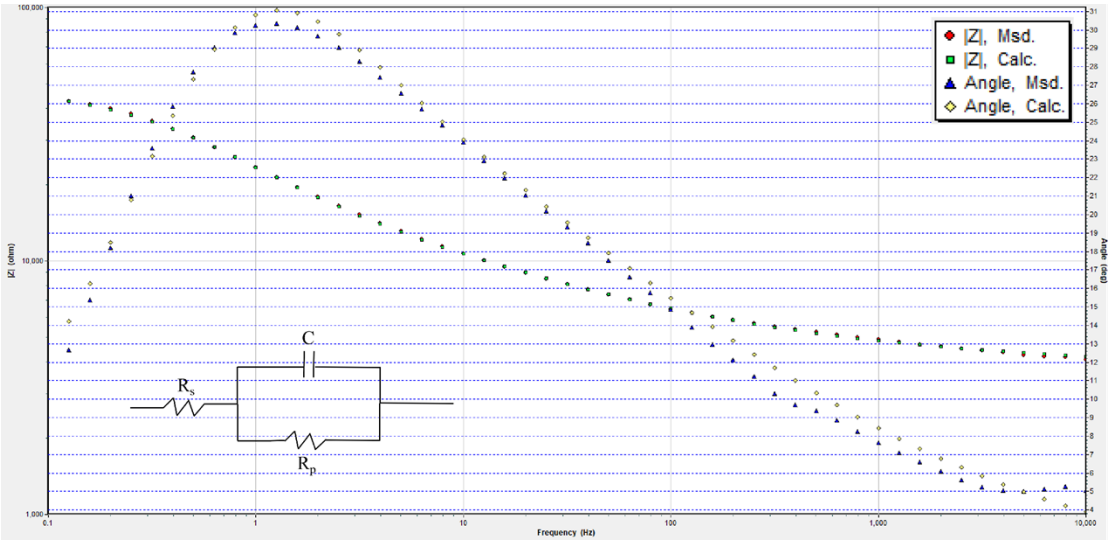

Figure S7. A typical Bode modulus plots of $Gr_{0.02}$-$ZnO_{0.4}$ sample demonstrating the fitted and experimental data by ZSimpWin software.

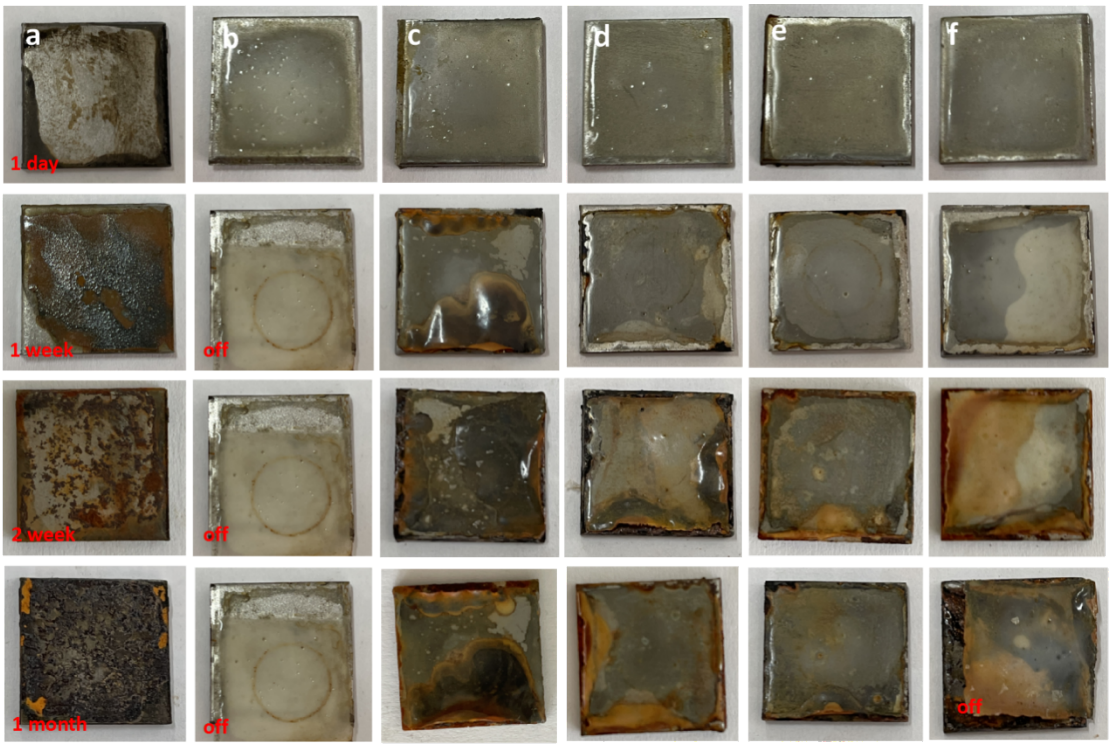

Figure S8. The photograph of bare Q235, Gr_0-ZnO_0, $Gr_{0.04}$-ZnO_0, $Gr_{0.02}$-$ZnO_{0.4}$, $Gr_{0.04}$-$ZnO_{0.4}$ and $Gr_{0.06}$-$ZnO_{0.4}$ were immersed in 50 mL 3.5wt% NaCl for accelerated corrosion test at different days.

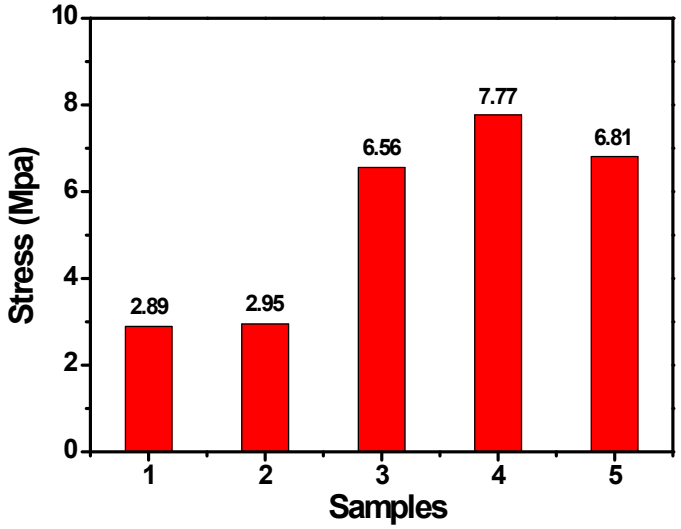

Figure S9. The interfacial bonding strength of Gr_0-ZnO_0, $Gr_{0.04}$-ZnO_0, $Gr_{0.04}$-$ZnO_{0.1}$, $Gr_{0.04}$-$ZnO_{0.4}$ and $Gr_{0.04}$-ZnO_1. Sample of 1, 2, 3, 4 and 5 are represent for Gr_0-ZnO_0, $Gr_{0.04}$-ZnO_0, $Gr_{0.04}$-$ZnO_{0.1}$, $Gr_{0.04}$-$ZnO_{0.4}$ and $Gr_{0.04}$-ZnO_1, respectively.

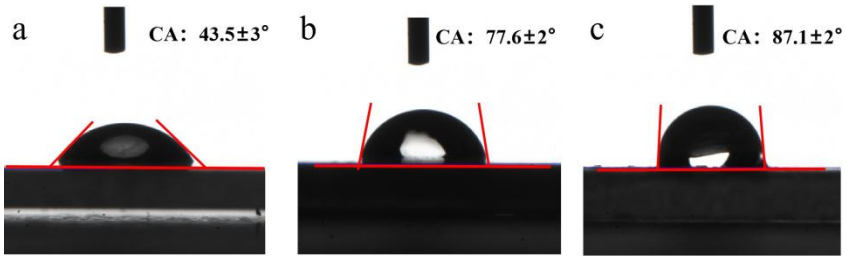

Figure S10. Water contact angle pictures of (a) Gr_0-ZnO_0, (b)$Gr_{0.04}$-ZnO_0 and (c) $Gr_{0.04}$-$ZnO_{0.4}$.