Table S1 Fitting parameters for the EIS of X65 steel immersed in aqueous phases at different corrosion periods at 8 MPa and 80 ℃.

Conditions	R_s (Ω cm^2)	Q_{dl} (Ω^{-1} cm^{-2} s^{-n1})	n_1	R_{ct} (Ω cm^2)	Q_f (Ω^{-1} cm^{-2} s^{-n1})	n_2	R_f (Ω cm^2)	L (H cm^2)	R_L (Ω cm^2)
1h	1.621	0.02006	0.7746	5.291	11.55	1	0.9751	0.1833	1.629
3h	1.565	0.004934	0.7069	5.007	0.2472	0.45	4.241	0.4098	2.8
17h	1.625	0.009333	0.8291	12.9	0.02212	0.8427	2.72		
30h	2.091	0.0009656	0.8544	18.42	2.37	0.9846	3.318		
54h	1.729	0.009241	0.8485	61.34	0.006554	0.93	5.714		
78h	1.562	0.005217	0.9674	39.63	0.002452	0.8004	13.19		
102h	1.539	0.004174	0.8995	35.05	0.007903	0.8422	8.002		
136h	1.593	0.004909	0.92	24.88	0.0115	0.8398	7.878		
168h	1.586	0.01207	0.7887	22.25	0.003646	0.8262	1.878		

Table S2 Fitting parameters for the EIS of 5Cr2Al steel immersed in aqueous phases at different corrosion periods at 8 MPa and 80 ℃.

Conditions	R_s (Ω cm^2)	Q_{dl} (Ω^{-1} cm^{-2} s^{-n1})	n_1	R_{ct} (Ω cm^2)	Q_{f1} (Ω^{-1} cm^{-2} s^{-n1})	n_2	R_{f1} (Ω cm^2)	L (H cm^2)	R_L (Ω cm^2)	Q_{f2} (Ω^{-1} cm^{-2} s^{-n1})	n_3	R_{f2} (Ω cm^2)	W (Ω^{-1} cm^{-2} s$^{-1/2}$)
1h	2.049	0.00169	0.7883	15.64	0.1005	0.7537	25.17						
3h	2.507	0.001245	0.7585	23.05	0.2272	0.9149	20.00						
17h	2.73	0.00396	0.5886	25.83	0.5317	0.9291	23.29	2.329	11.87				
30h	6.095	0.0008664	0.6431	1.577	0.002585	0.724	83.06			1.091	0.89	15.19	
54h	2.074	0.0004706	0.7401	2.837	0.003679	0.7984	101			0.08326	0.88	180	
78h	1.913	0.004404	0.5385	5.181	0.0578	1	438.3			0.0008611	0.9866	360	
102h	2.261	0.004384	1	80.49	0.09981	0.8152	416.5						0.01334
136h	1.999	0.002168	1	107.6	0.01362	0.675	813						0.008545
168h	1.981	0.001524	0.8764	290.7	0.007333	0.5758	2647						0.008614