

## Supporting information

### Poly(ionic liquid)s having coumarate counter-anions as corrosion inhibitors in acrylic UV coatings

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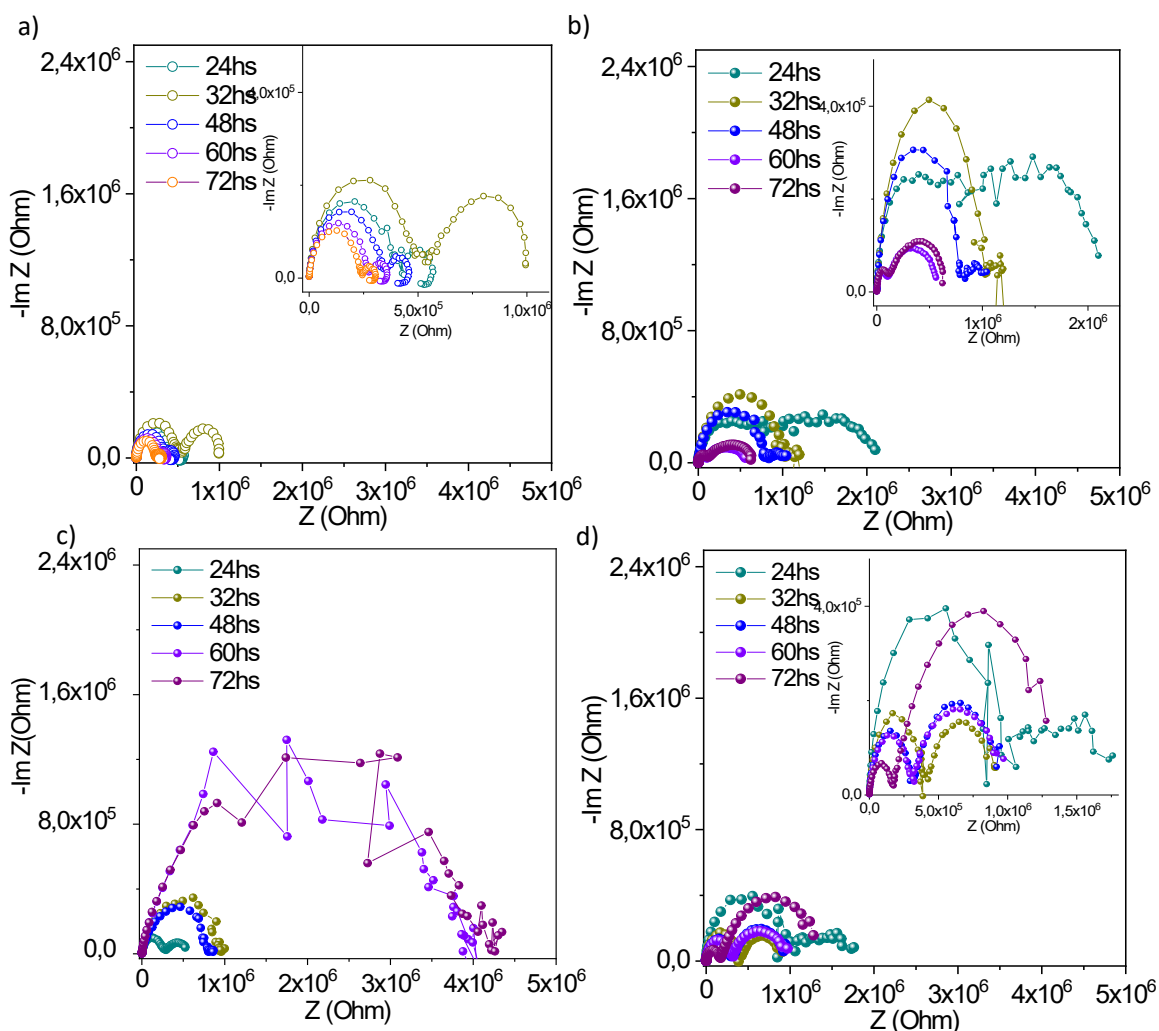


Figure S1: Nyquist plot of electrochemical impedance spectra for different polymer coatings on AS1020 mild steel immersed in 0.01 M NaCl a) coating without inhibitor (control), b) PolyDADMA-COU 5 wt %, c) PolyDADMA-COU 10 wt %, d) PolyDADMA-COU 20 wt %

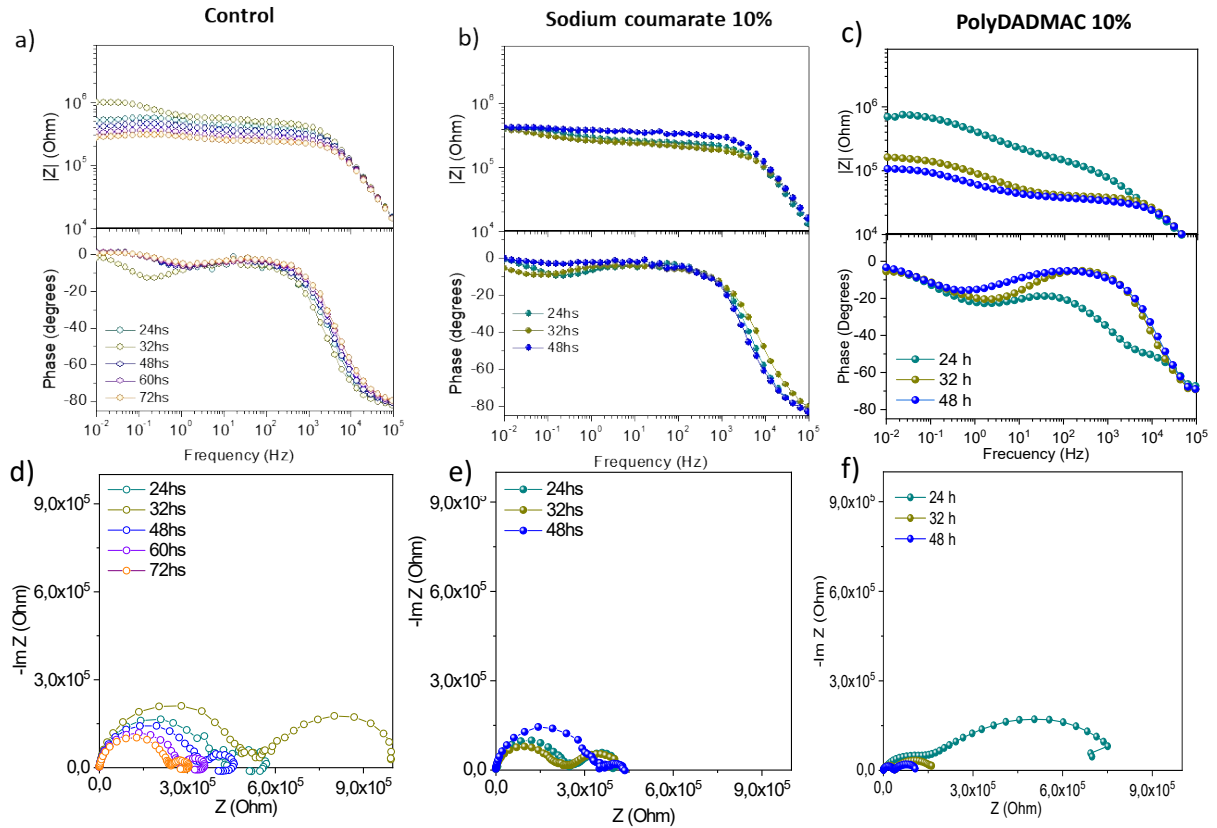
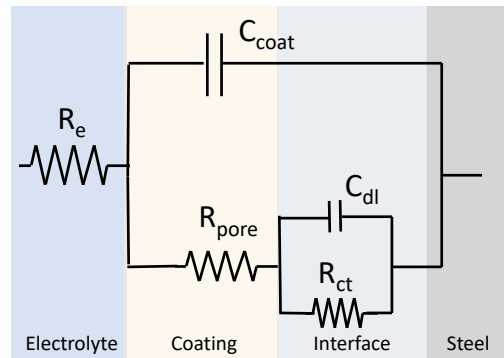


Figure S2: a), b) and c) Bode plots of the electrochemical impedance of control coating, coating containing 10 wt% of sodium coumarate and coating containing 10 wt% of PolyDADMAC respectively. C), d) and e) Nyquist plot of control coating, coating containing



10 wt% of sodium coumarate and coating containing 10 wt% of PolyDADMAC respectively

Figure S3: Equivalent circuits used for numerical fitting of the EIS data

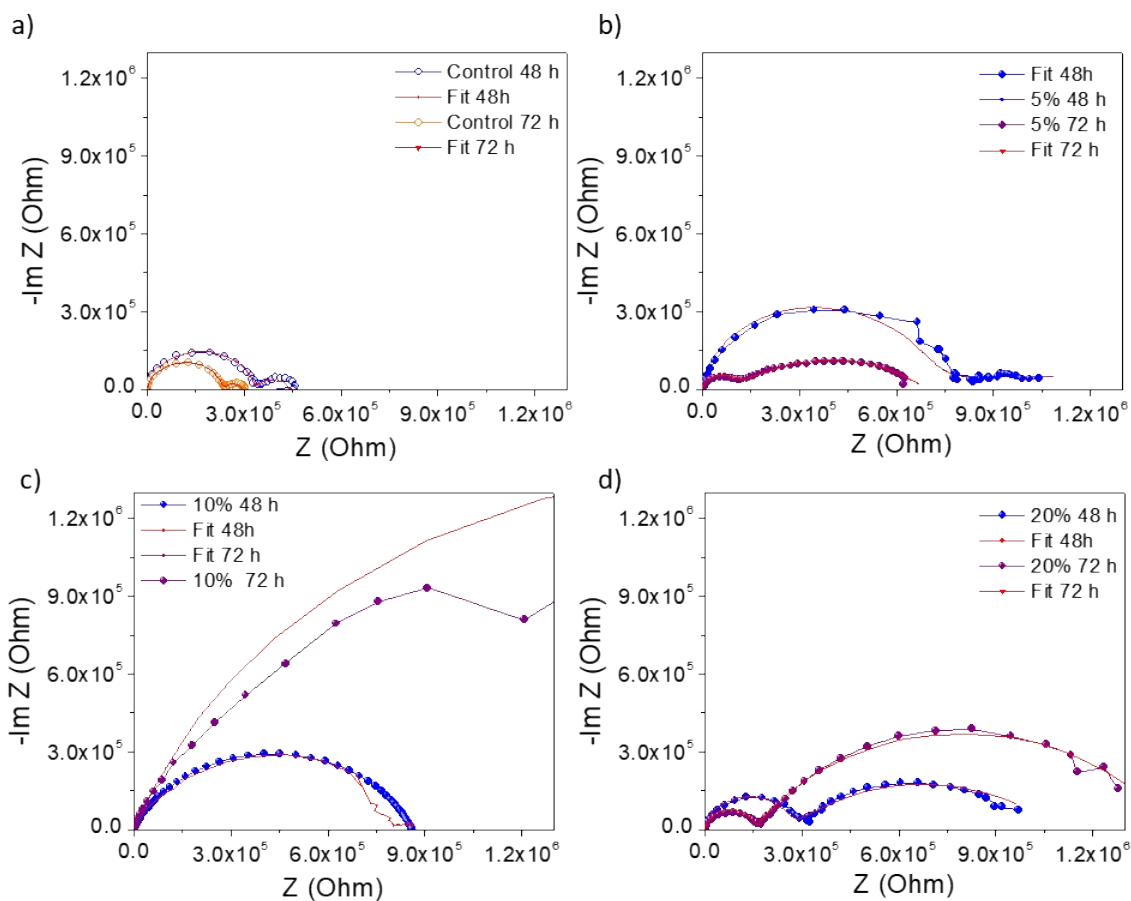


Figure S4: Nyquist plots for 48 h and 72 h from EIS experiment and mathematically fitted Nyquist plots (red line) of a) control coating b), c), and d) coating containing 5%, 10% and 20% of polyDADMA-COU.

Sample	Time (h)	$C_{\text{coat}}$ ( $\text{nF} \cdot \text{s}^{\text{ncoat}-1}$ )	$n_{\text{coat}}$	$R_{\text{pore}}$ ( $\Omega$ )	$C_{\text{dl}}$ ( $\mu\text{F} \cdot \text{s}^{\text{ndl}-1}$ )	$n_{\text{dl}}$	$R_{\text{ct}}$ ( $\Omega$ )	$\chi^2/ Z $
Control	48	0.25	0.94	330232	1.45	0.60	134274	0.44
	72	0.30	0.93	232933	3,12	0.56	90326	0.62
5%	48	0.30	1	606384	1.17	0.26	516530	4,87
	72	0.92	0,93	89648	0.77	0.44	612585	0.40
10%	48	1.05	0,98	775666	0,01	0.59	812840	4,64
	72	0.69	1	773178	0.01	0.69	3342000	10.07
20%	48	0.50	0.97	258736	1.14	0.50	837389	3.76
	72	0.63	1	153880	0.98	0.66	1289000	9.20

Table S1: Fitting results for coatings after 48 h and 72 h of experiment

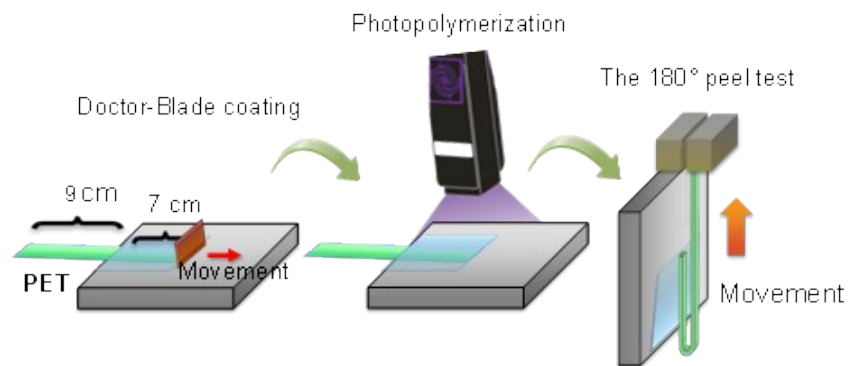


Figure S5: Adhesion test setup