Table S2B | Parameter distribution statistics across noise levels for MXene EIS inference. For the same noise-injection and multi-start refit protocol as Table S2A, this table reports parameter-wise distributions of the recovered θ at each noise level, including mean, standard deviation, coefficient of variation (CV%), median, and P5–P95 quantiles. These statistics quantify noise-driven drift, dispersion, and heteroscedastic sensitivity across parameters (including the CPE exponents α_1,α_2), and provide the distribution-level evidence used in the identifiability and robustness discussion.

Noise (%)	Parameter	Mean	Std	CV (%)	Median	P5	P95
0.00	R_s	1.065	0.3482	32.69	1.044	0.6662	1.508
0.00	L	1.950x10^{-7}	4.229 x10^{-8}	21.69	1.906 x10^{-7}	1.442 x10^{-7}	2.457 x10^{-7}
0.00	R_{ct}	17.48	4.386	25.08	16.33	12.55	22.74
0.00	Q_1	0.003278	7.980 x10^{-4}	24.35	0.003355	0.002265	0.004135
0.00	α_1	0.8228	0.03089	3.75	0.8145	0.7874	0.862
0.00	Q_2	0.002111	2.772 x10^{-5}	1.31	0.002116	0.002072	0.002139
0.00	α_2	0.9077	0.01615	1.78	0.9073	0.8885	0.9254
0.50	R_s	1.133	0.4397	38.81	1.16	0.6449	1.687
0.50	L	1.989 x10^{-7}	3.085 x10^{-8}	15.51	1.978 x10^{-7}	1.652 x10^{-7}	2.339 x10^{-7}
0.50	R_{ct}	19.53	5.601	28.68	19.73	12.39	26.26
0.50	Q_1	0.003469	9.675 x10^{-4}	27.89	0.00314	0.002549	0.004689
0.50	α_1	0.8247	0.05065	6.14	0.8038	0.7784	0.8964
0.50	Q_2	0.002113	6.554 x10^{-5}	3.10	0.002107	0.002029	0.002188
0.50	α_2	0.9154	0.03689	4.03	0.9159	0.8709	0.9612
1.00	R_s	1.204	0.3336	27.69	1.073	0.8701	1.635
1.00	L	2.127 x10^{-7}	6.469 x10^{-8}	30.41	1.979 x10^{-7}	1.481 x10^{-7}	2.927 x10^{-7}
1.00	R_{ct}	19.48	3.42	17.55	20.41	14.84	22.81
1.00	Q_1	0.003467	0.001224	35.31	0.003025	0.002495	0.005231
1.00	α_1	0.823	0.05583	6.78	0.8331	0.7439	0.8776
1.00	Q_2	0.002125	6.453 x10^{-5}	3.04	0.002143	0.002034	0.002188
1.00	α_2	0.9139	0.02038	2.23	0.9163	0.889	0.9355
2.00	R_s	0.8799	0.1632	18.55	0.92	0.6465	1.04

2.00	L	1.779 x10^{-7}	4.314 x10^{-8}	24.25	1.604 x10^{-7}	1.431 x10^{-7}	2.410 x10^{-7}
2.00	R_{ct}	22.26	12.6	56.61	17.43	12.37	41.05
2.00	Q_1	0.003239	0.001018	31.44	0.003225	0.002028	0.004311
2.00	α_1	0.8598	0.04164	4.84	0.8745	0.8048	0.9007
2.00	Q_2	0.002158	7.696 x10^{-5}	3.57	0.002152	0.002066	0.002254
2.00	α_2	0.9079	0.03206	3.53	0.9078	0.8694	0.9478
3.00	R_s	1.015	0.3394	33.44	0.9803	0.61	1.434
3.00	L	2.189 x10^{-7}	5.604 x10^{-8}	25.60	1.917 x10^{-7}	1.729 x10^{-7}	2.964 x10^{-7}
3.00	R_{ct}	19.72	2.559	12.98	18.74	17.48	23.04
3.00	Q_1	0.003089	9.982 x10^{-4}	32.32	0.003039	0.002054	0.004437
3.00	α_1	0.8153	0.01957	2.40	0.8186	0.7885	0.8348
3.00	Q_2	0.002088	5.138 x10^{-5}	2.46	0.002106	0.002018	0.002139
3.00	α_2	0.9273	0.02177	2.35	0.919	0.9089	0.9594
5.00	R_s	1.368	0.5745	42.01	1.494	0.6247	1.949
5.00	L	1.820 x10^{-7}	3.285 x10^{-8}	18.05	1.844 x10^{-7}	1.407 x10^{-7}	2.163 x10^{-7}
5.00	R_{ct}	20.56	3.148	15.32	20.23	16.97	24.13
5.00	Q_1	0.003564	0.00152	42.65	0.003686	0.001781	0.005169
5.00	α_1	0.8115	0.06823	8.41	0.8246	0.7153	0.8761
5.00	Q_2	0.002098	8.417 x10^{-5}	4.01	0.002095	0.002003	0.00221
5.00	α_2	0.9197	0.03437	3.74	0.9228	0.8758	0.9613
8.00	R_s	1.404	0.488	34.76	1.325	0.9166	2.086
8.00	L	1.880 x10^{-7}	2.556 x10^{-8}	13.60	1.833 x10^{-7}	1.636 x10^{-7}	2.177 x10^{-7}
8.00	R_{ct}	21.51	5.499	25.56	20.4	15.78	28.92
8.00	Q_1	0.003377	6.307 x10^{-4}	18.68	0.003315	0.002691	0.004119
8.00	α_1	0.8435	0.05029	5.96	0.8468	0.7842	0.8949
8.00	Q_2	0.002139	8.094 x10^{-5}	3.78	0.002144	0.002032	0.00223
8.00	α_2	0.9166	0.02322	2.53	0.9099	0.8957	0.9503