

Supplementary Materials

Analysis of Fig Leaf Extract as Steel Eco-friendly Corrosion Inhibitor in Acidic Medium: Electrochemical, Gravimetric, Spectroscopic, and Surface Studies

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Table S1. Chemical composition of the Mild steel (SM)

Element	C	Mn	Si	P	S	Al	Cu	Cr	Ni	Fe
%	0.1	0.29	0.04	0.004	0.005	0.07	0.034	0.007	0.011	99.13

Table S2. Corrosion rates of mild steel in 1M HCl, in the absence and presence of different concentrations FLE at various temperatures in the range (298K-338K)

C_{FLE} (mL/mL)	CR (mg.cm ⁻² .h ⁻¹)				
	298 K	308 K	318 K	328 K	338 K
0	0.212637922	0.252507532	0.315159569	0.978307829	3.007147556
0.05	0.067393215	0.10483389	0.164738971	0.269088092	0.580034333
0.10	0.086498755	0.09514863	0.095148630	0.182436095	0.3583556615
0.15	0.089288584	0.089288584	0.080359725	0.209611526	0.412672936
0.20	0.090665513	0.072532411	0.130286635	0.254908633	0.339878778
0.25	0.105740436	0.079305327	0.075360117	0.127532505	0.295643535

Table S3. Inhibitory efficiency as a function of FLE concentrations at various temperatures

C_{FLE} (mL/mL)	EI%				
	298 K	308 K	318 K	328 K	338 K
0.05	68.30	58.60	47.72	72.49	80.71
0.10	59.32	62.31	69.80	81.35	88.08
0.15	58.00	64.63	74.50	78.57	86.27
0.20	57.36	71.27	58.66	73.94	88.69
0.25	50.27	68.59	76.08	86.96	90.16

Table S4. Correlation coefficients, slope, and intercept of Isotherm models for FLE at different temperatures varied between (298K - 338K)

Model	298 K	308 K	318 K	328 K	338 K
	y = ax + b				
Langmuir	a = 2.1	a = 1.3	a = 1.38	a = 1.22	a = 1.06
$\frac{C}{\theta} = \frac{1}{K} + C$	b = -0.049	b = 0.018	b = 0.007	b = 0.003	b = 0.007
	R ² = 0,9868	R ² = 0,9948	R ² = 0,91	R ² = 0,9761	R ² = 0,9989
Temkin	a = 0.072	a = 0.24	a = 0.081	a = 0.049	a = 0.05
$\theta = \frac{1}{K} + \ln K \times C$	b = 0.224	b = 1.004	b = 0.379	b = 0.88	b = 0.972
	R ² = 0,1753	R ² = 0,3797	R ² = 0,3697	R ² = 0,2946	R ² = 0,7856
Freundlich	a = 1.44	a = 0.083	a = 1.62	a = 0.4	a = 0.4
$\ln \frac{C(1-\theta)}{\theta} = \ln K + C$	b = 0.224	b = 0.253	b = 0.379	b = 0.72	b = 0.804
	R ² = 0,1753	R ² = 0,2635	R ² = 0,3697	R ² = 0,2985	R ² = 0,6757
Frumkin	a = -3.56	a = -3.054	a = -2.56	a = -0.156	a = 6.76
$\ln \theta = \ln K + \alpha \ln C$	b = -0.1169	b = -0.462	b = -0.680	b = -3.20	b = -9.755
	R ² = 0,7916	R ² = 0,7548	R ² = 0,2314	R ² = 0,0003	R ² = 0,4437

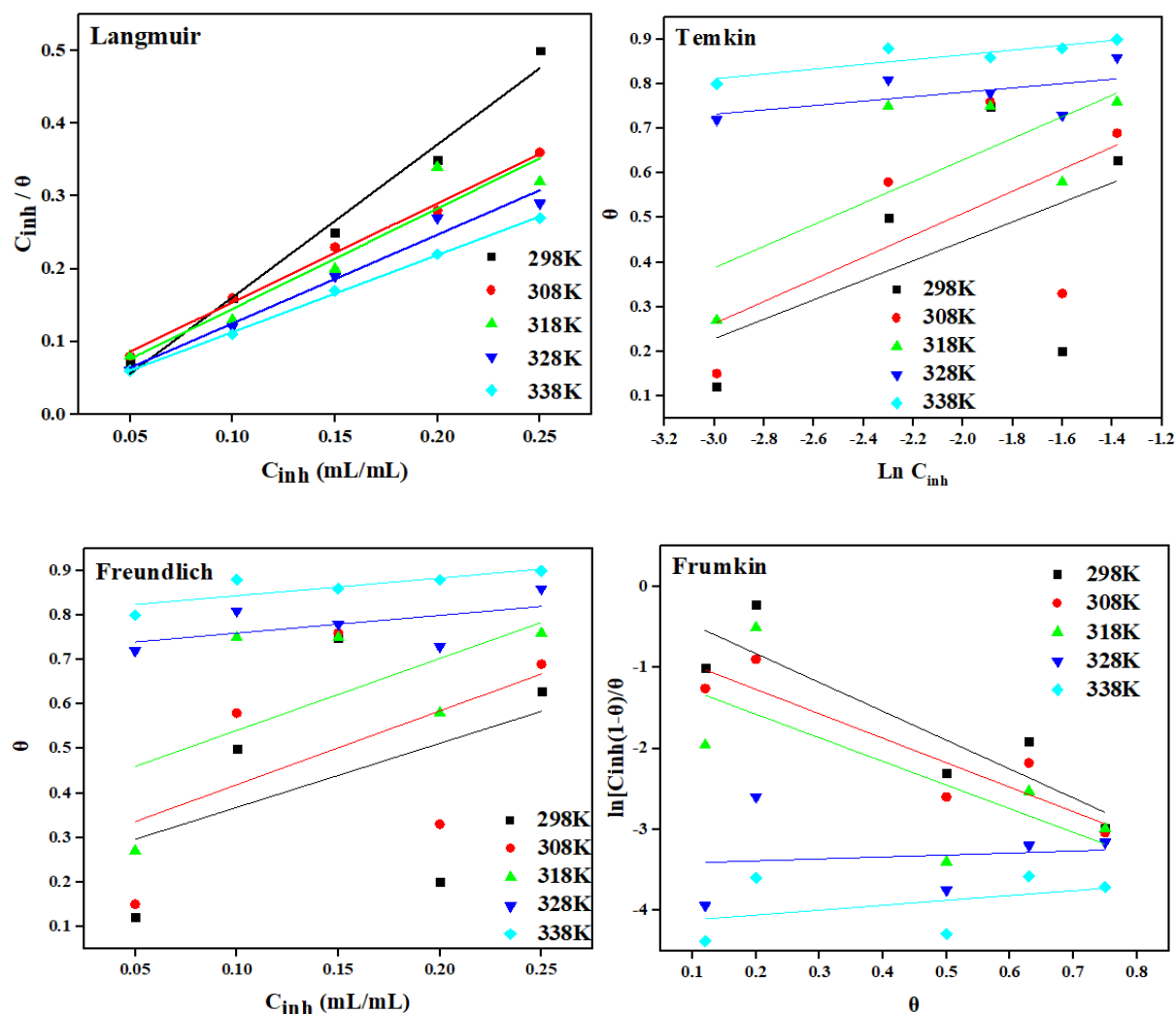


Figure S1. Langmuir, Temkin, Freundlich, and Frumkin adsorption isotherms FLE in 1M HCl