Enhanced removal of heavy metals from electroplating wastewater through

electrocoagulation using carboxymethyl chitosan as corrosion inhibitor for steel anode

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1. *Concentration of different compounds on the inhibited anode surface*

Values of the binding energy and the area percentage for the contributions to each signal were shown in Table 1S. Then the concentration of different compounds on the inhibited anode surface was calculated according to:

$$C_i = \frac{\dfrac{I_{(i)}}{SF_i}}{\left[\dfrac{I(C_{1s})}{SFC_{1s}} + \dfrac{I(Fe_{2p})}{SFFe_{2p}} + \dfrac{I(O_{1s})}{SFO_{1s}}\right]}$$

where *I* and *SF* represent the intensity of signals and sensitive factors (that is, 0.278 for C, 2.957 for Fe and 0.78 for O).

Table 1S. BE values, intensity of signals and the area percentage for the contributions to each signal.

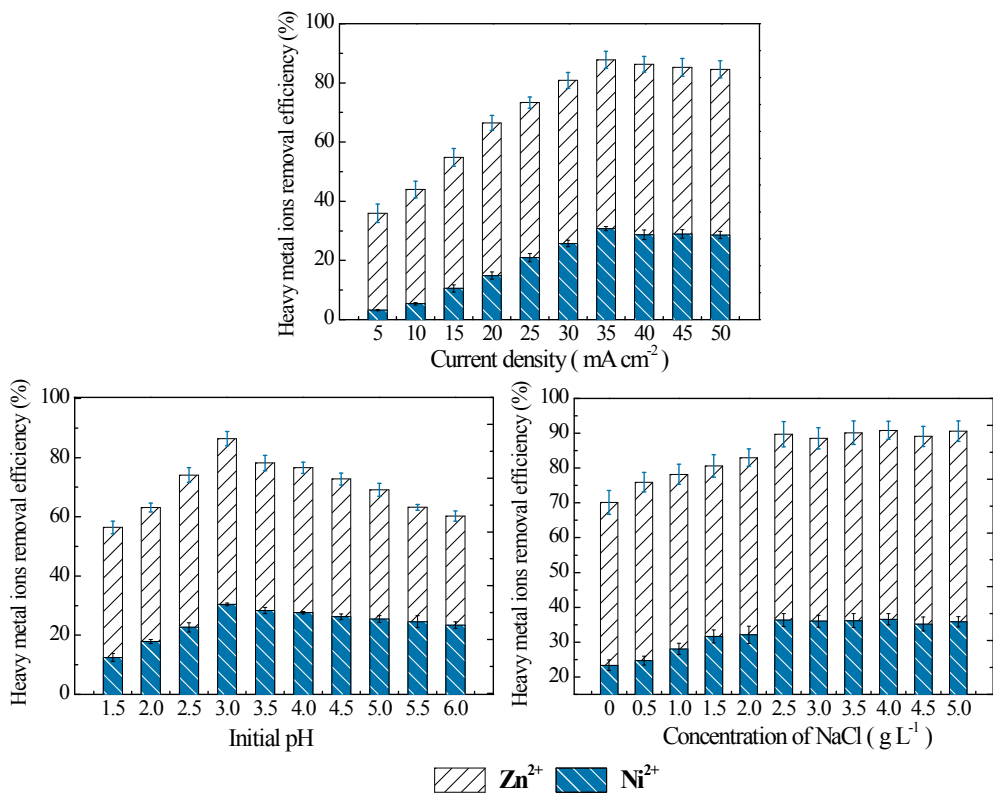| XPS peaks		Binding energy / eV	Intensity of signals	Area percentage for the contributions to each signal (%)
C 1s	COO⁻	288.2	2026.37	36.39
	C=N	286.5	30.38	0.55
	C-C	284.2	2606.83	46.81
	C-COO	285.6	904.68	16.25
Fe 2p	Fe-N	707.1	106.98	0.67
	COO-Fe	712.9	3139.76	19.75
	FeO	709.8	12650.77	79.58
O 1s	FeO	530.9	7675.13	79.57
	COO-Fe	532.4	128.11	1.33
	Fe₃O₄	530.0	1842.82	19.10

Fig 1S. The effect of the current density, initial pH and the concentration of NaCl on heavy metal

ions removal efficiency of the control.