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Supplementary material

SUPPLEMENTARY MATERIAL TO

Ternary Zn–Ni–Co alloy: anomalous codeposition and corrosion stability

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The Zn content in the ternary alloys for deposition solutions with different $[Co^{2+}]/[Ni^{2+}]$ ratios, along with the corresponding CRLs indicate that the amount of Zn does not change much with the deposition current density (Fig. S-1a and b) and in both plating solutions it is well above the CRLs, suggesting preferential Zn deposition.

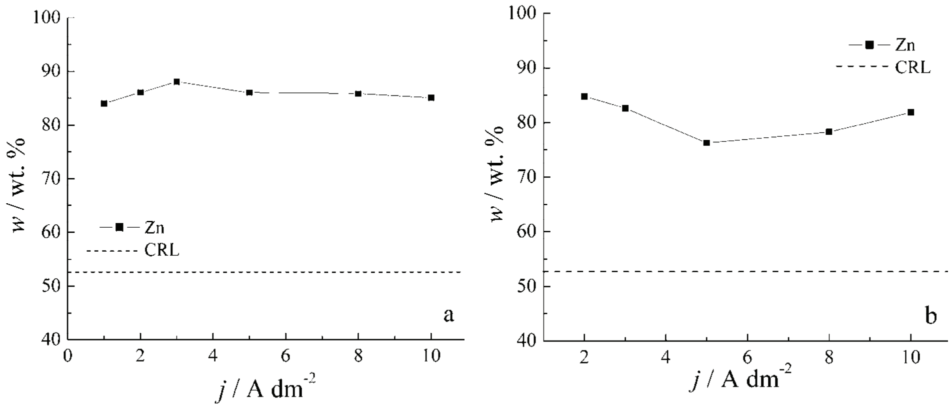

Fig. S-1. Dependence of Zn content in the Zn–Ni–Co alloys on deposition current density for alloys deposited from the solution with $[Co^{2+}]/[Ni^{2+}]$: a) 0.12 and b) 0.90.

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The long-term protection was evaluated by following the change in the open circuit potential with time of exposure to a 3 % NaCl solution. The time dependence of E_{ocp} for steel coated with Zn–Ni–Co alloys deposited from different plating solutions at different current densities is shown in Fig. S-2. The open circuit potential of bare steel surface in 3 % NaCl is marked with a line in Fig. S-2 (–640 mV *vs*. SCE).

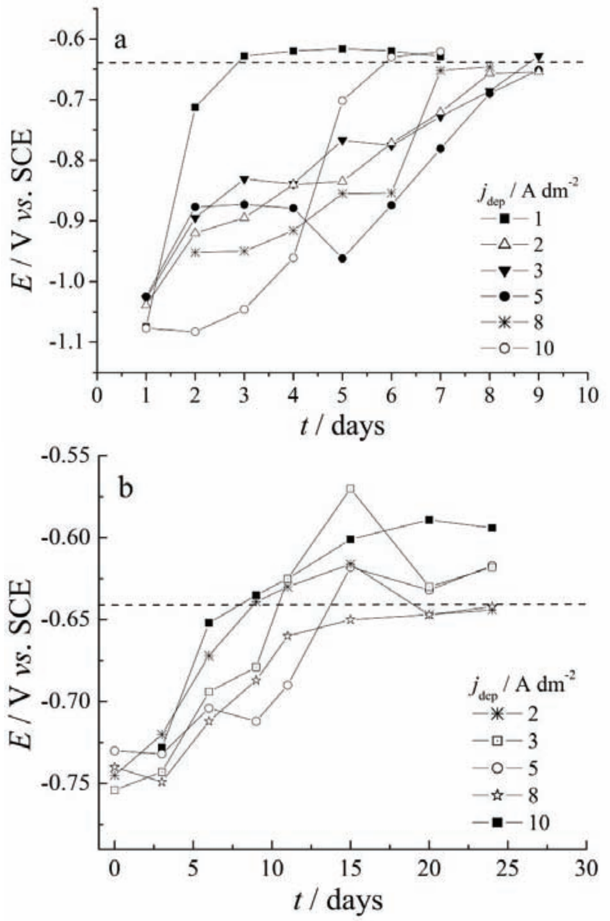

Fig. S-2. The dependence of E_{ocp} for Zn–Ni–Co alloys deposited on steel from solution with $[Co^{2+}]/[Ni^{2+}]$: a) 0.12 and b) 0.90.