

Supplementary Materials

The Influence of the Electrodeposition Parameters on the Properties of Mn-Co-Based Nanofilms as Anode Materials for Alkaline Electrolysers

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Received: 21 May 2020; Accepted: 10 June 2020; Published: 11 June 2020

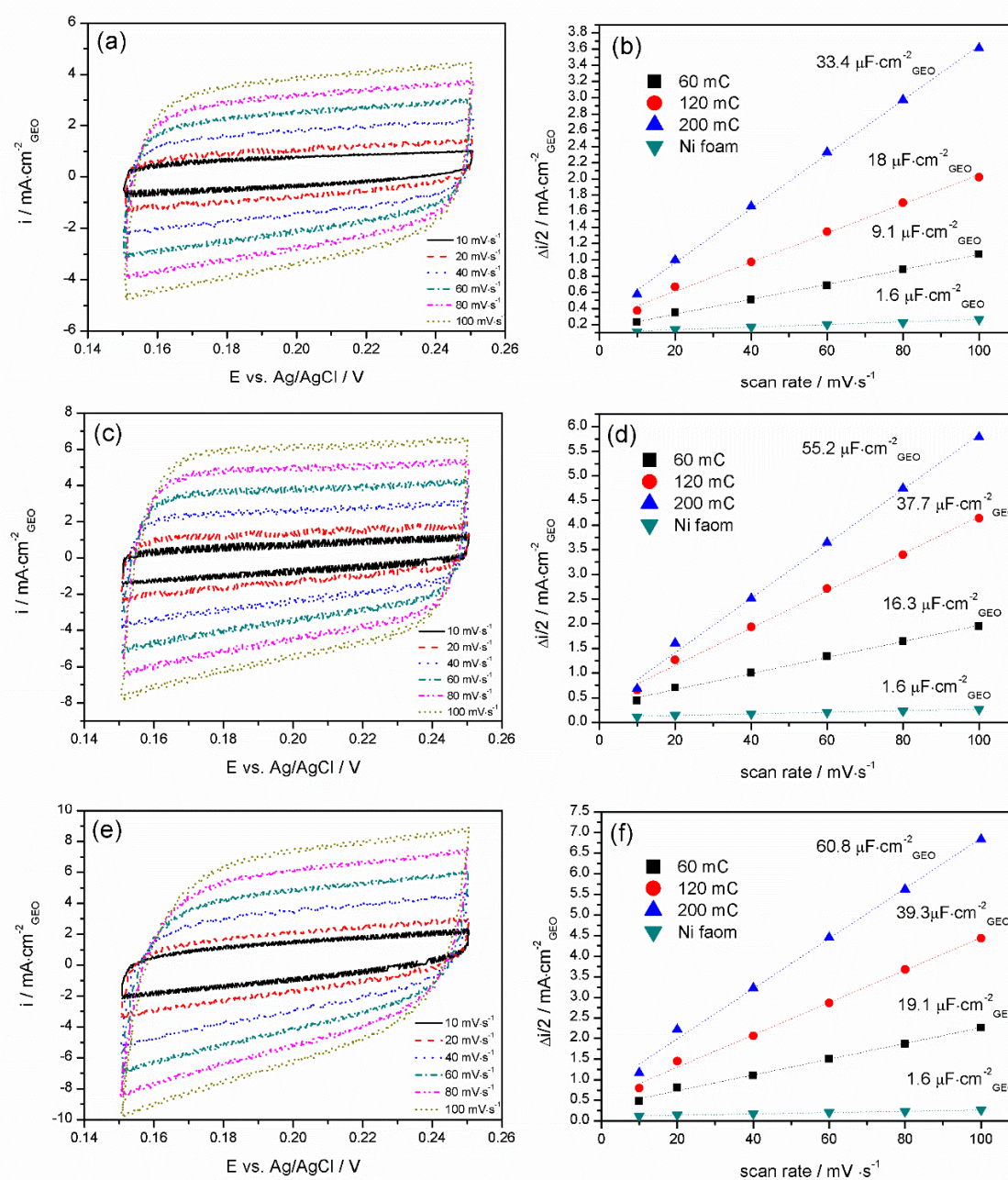


Figure S1. Cyclic voltammograms recorded during sweeping the potential from 0.15 to 0.25 V vs. Ag/AgCl with different scan rates in aqueous solution of 1 M KOH for Mn-Co film synthesized in solution of Mn:Co 2:4 mM (a), 2:6 mM (c) and 2:8 mM (e) for 200 mC. Corresponding linear approximation of the capacitive currents versus scan rate obtained from cyclic voltammograms for Mn-Co film synthesized in solution of Mn:Co 2:4 mM (b), 2:6 mM (d) and 2:8 mM (f) for different deposition charge.

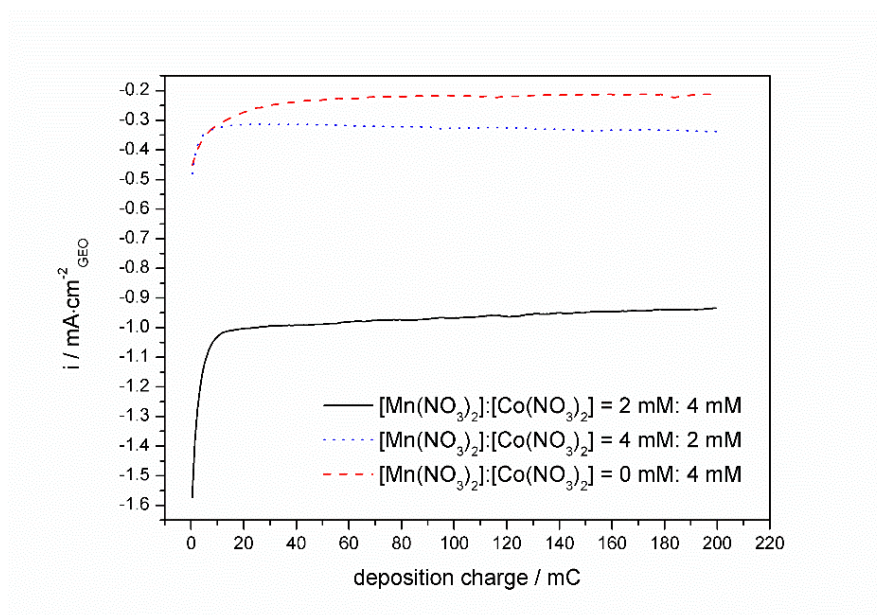


Figure S2. Synthesis graphs recorded during the potentiostatic deposition of Mn/Co oxide/hydroxides at -1.1 V vs. Ag/AgCl in aqueous solution of differently concentrated $\text{Mn}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ and $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ with electropolymerization time limited by a charge of 200 mC.

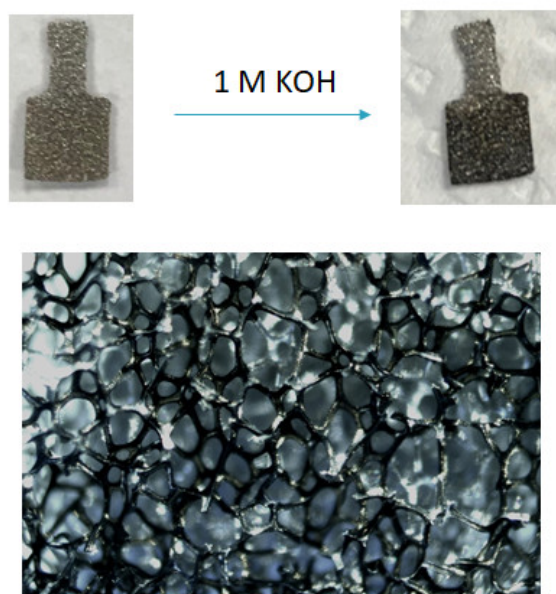


Figure S3. Optical microscopy image of the as-deposited and after alkaline treatment in 1 M KOH Mn-Co film on nickel foam.

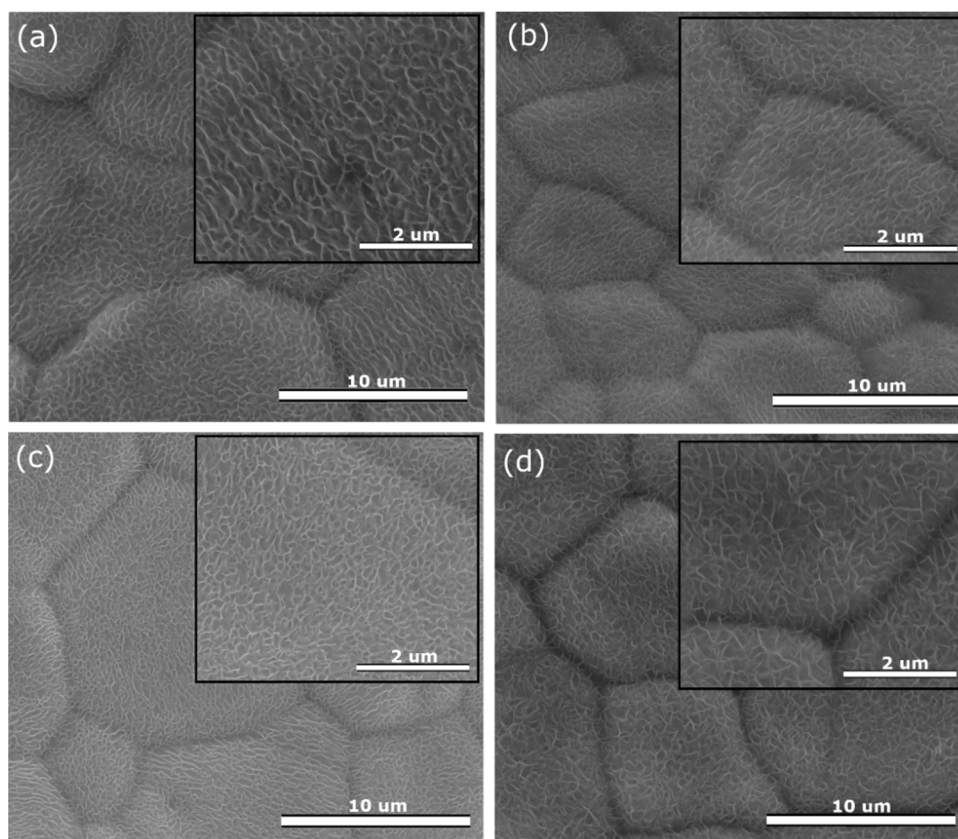


Figure S4. SEM images of Mn-Co film synthesized in aqueous solution of Mn:Co 2:4 mM for 60 mC (a), 2:4 mM for 120 mC (b), 2:4 mM 200 mC (c) and 2:6 mM 200 mC (d) on nickel foam.

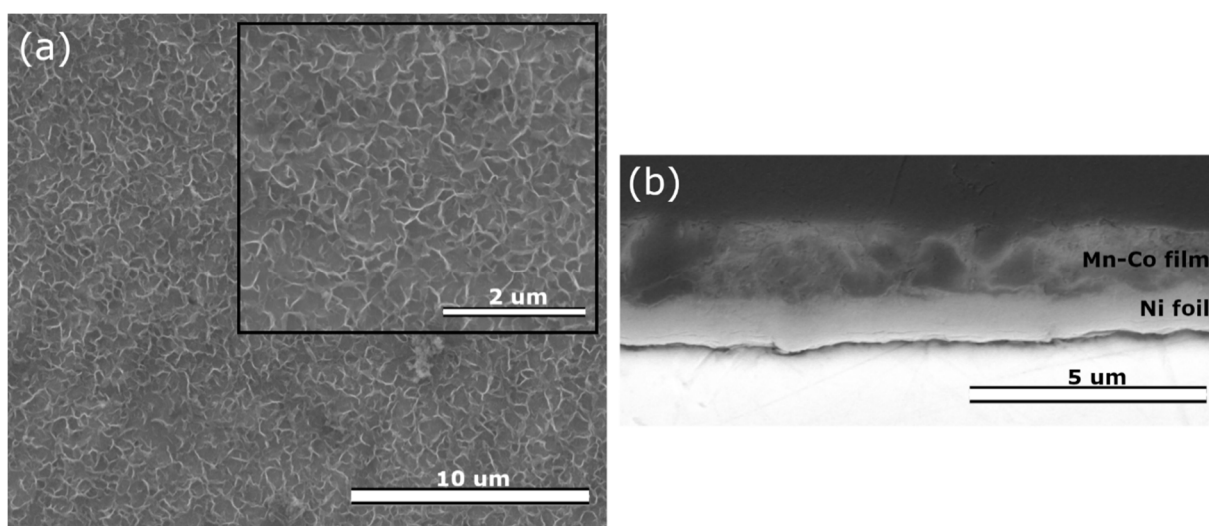


Figure S5. SEM images of Mn-Co film synthesized in aqueous solution of Mn:Co 2:4 mM for 60 mC (a) and 2:8 mM for 200 mC (b) on nickel foil.

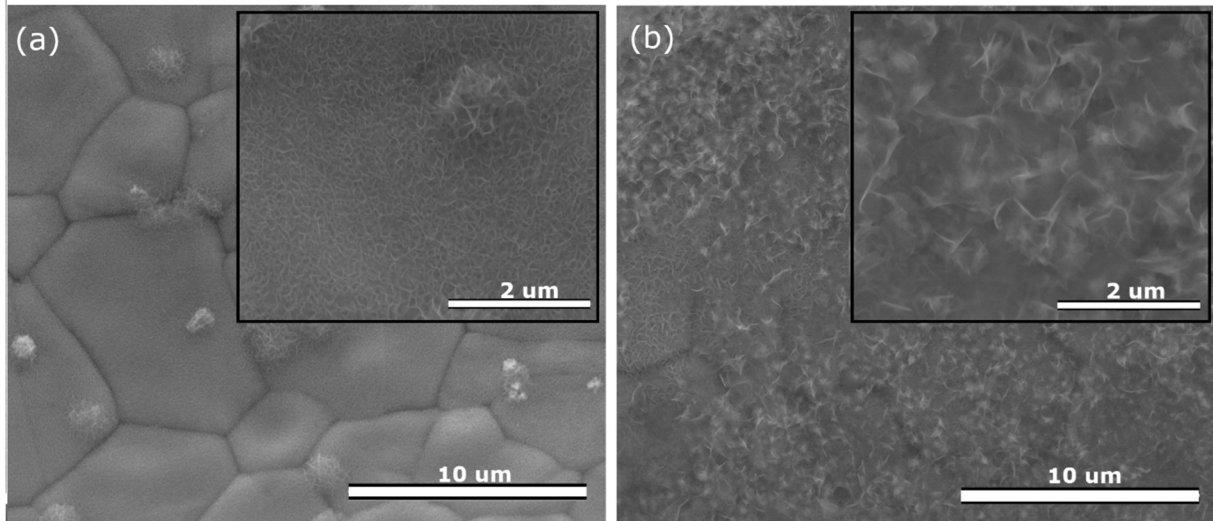


Figure S6. SEM images of Mn-Co film synthesized in aqueous solution of (a) 4 mM $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ or (b) 4 mM $\text{Mn}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ and 2 mM $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ on nickel foam for 200 mC

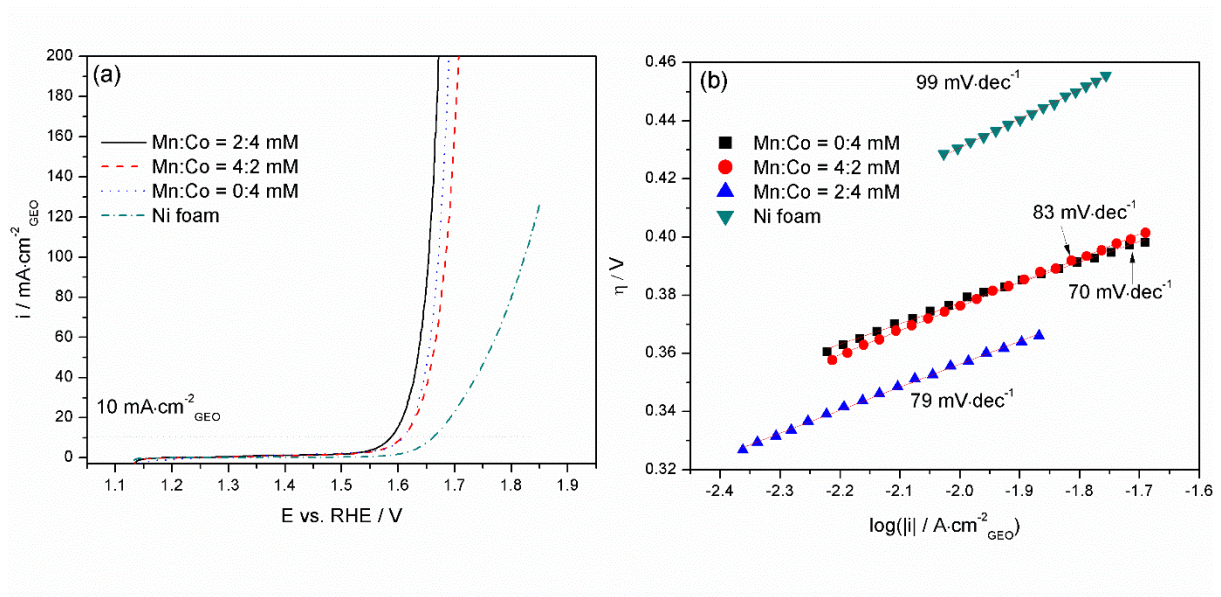


Figure S7. Linear sweep voltammetry profiles (a) and corresponding Tafel plots (b) of Mn-Co film synthesized in solution of Mn:Co 2:4 mM, 4:2 mM and 0:4 mM on nickel foam measured in Ar-purged 1 M KOH. .

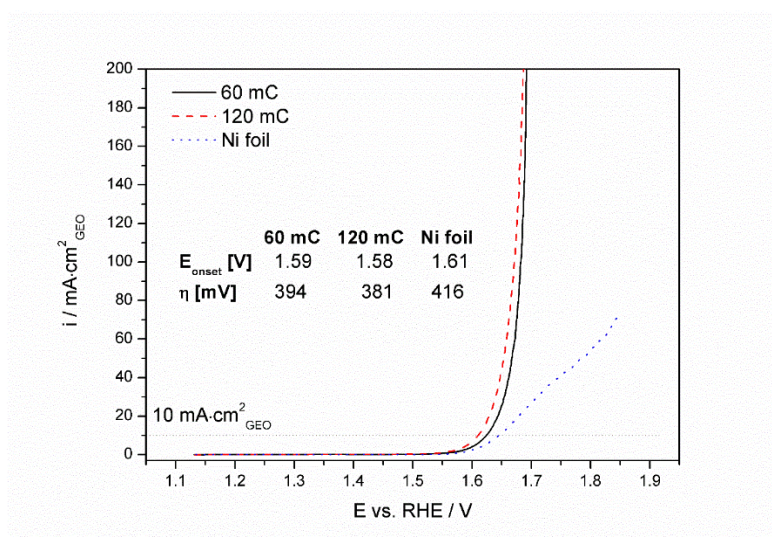


Figure S8. Linear sweep voltammetry profiles of nickel foil and Mn-Co film synthesized in solution of Mn:Co 2:8 mM for 60 and 120 mC on nickel foil.

Table S1. Comparison of catalyst based on Mn and/or Co transition metals synthesized electrochemically for OER activity available in the literature.

catalyst	substrate	solution	E_{onset} / V vs. RHE	η ($10 \text{ mA} \cdot \text{cm}^{-2}_{\text{geo}}$) / mV	Ref.
Mn-Co	Ni foam	1 M KOH	1.47	335	This work
CoMn-LDH	carbon	0.1 M KOH	-	258	[1]
MnO ₂	carbon	0.1 M KOH	-	424	[1]
MnO _x -573K	F:SnO ₂	1 M KOH	-	570 at $20 \text{ mA} \cdot \text{cm}^{-2}_{\text{geo}}$	[2]
Mn ₃ O ₄	F:SnO ₂	1 M KOH	-	570	[2]
Co ₃ O ₄	Ni foil	0.1 M KOH	1.58	530	[3]
Co ₃ O ₄	SS	1 M KOH	-	603 at $100 \text{ mA} \cdot \text{cm}^{-2}_{\text{geo}}$	[4]
Co ₃ O ₄	Pt	1 M KOH	-	410	[5]
Ni _{0.6} Co _{2.4} O ₄	Ni foil	0.1 M KOH	1.57	-	[3]
Zn _x Co _{3-x} O ₄	Au	1 M NaOH	-	330	[6]
ZnCo ₂ O ₄	Ni foam	1 M KOH	-	390	[5]

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