

Supplementary information

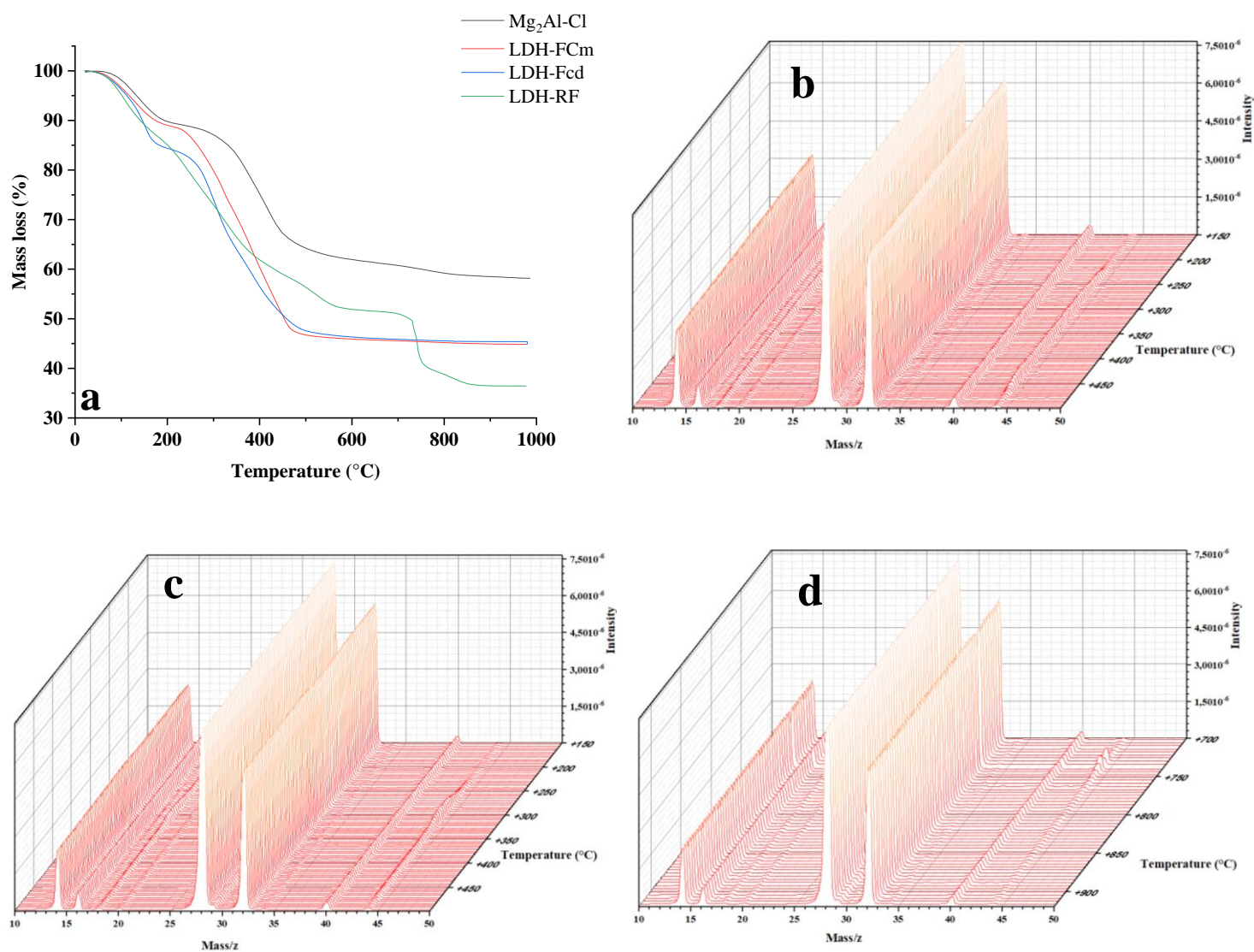


Figure S1. (a) TGA of LDH-Cl, LDH-RF, LDH-FCm and LDH-FCd , and stacked Mass Spectrographs as a function of the temperature for (b) LDH-RF , (c) LDH-FCm, and (d) LDH-FCd

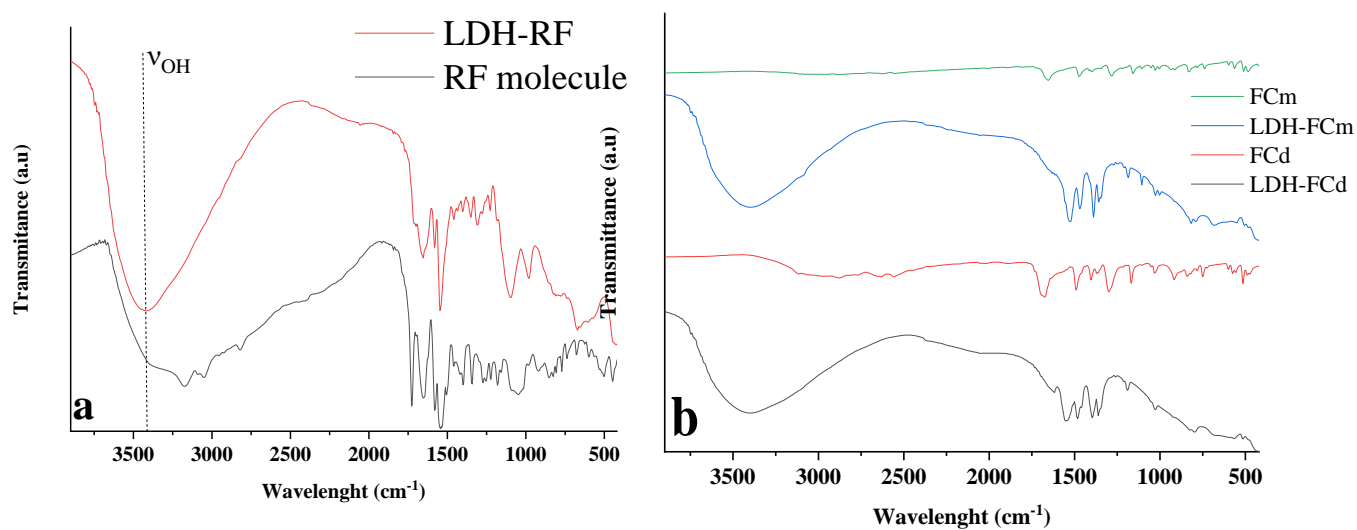


Figure S2. Infrared spectrum of (a) RF and LDH-RF and (b) FCm, LDH-FCm, FCd, LDH-FCd

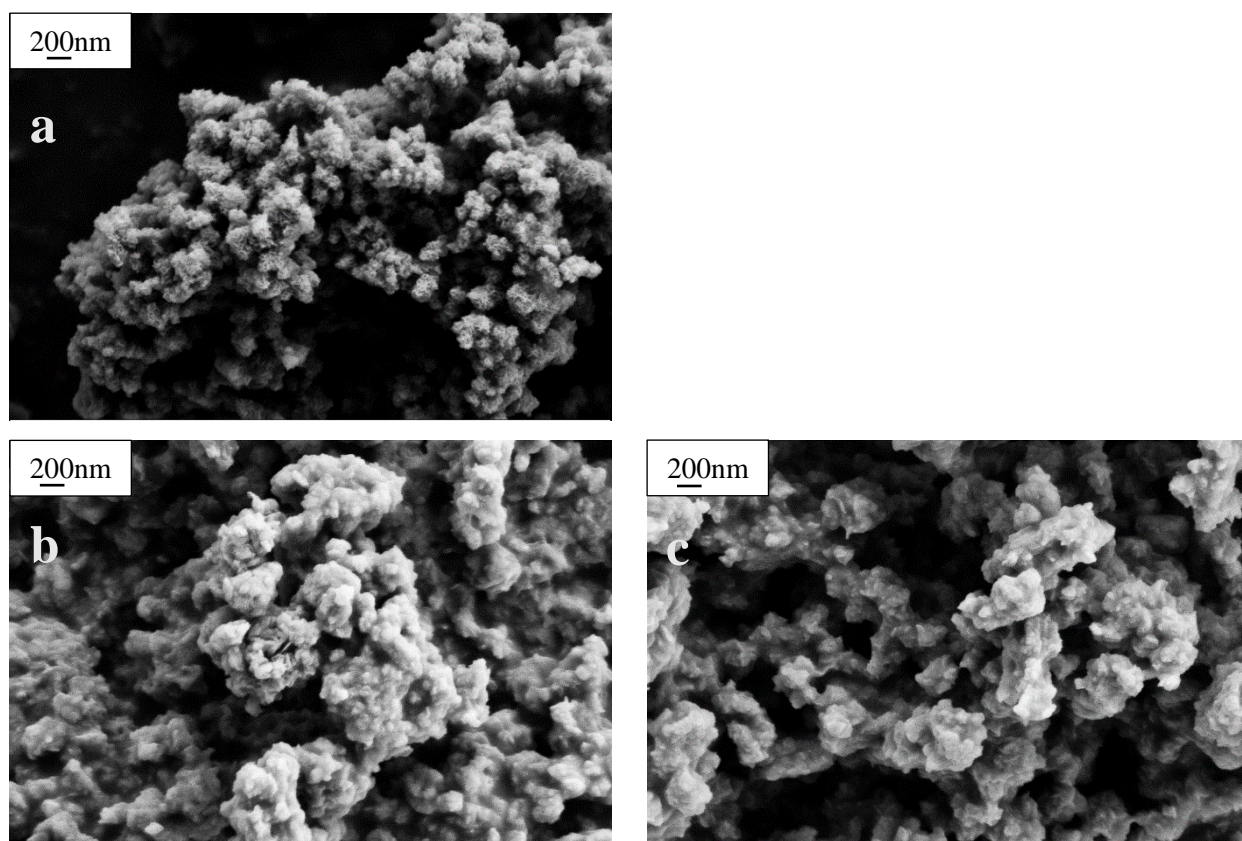


Figure S3. SEM images of (a) LDH-RF, (b) LDH-FCm and (c) LDH-FCd

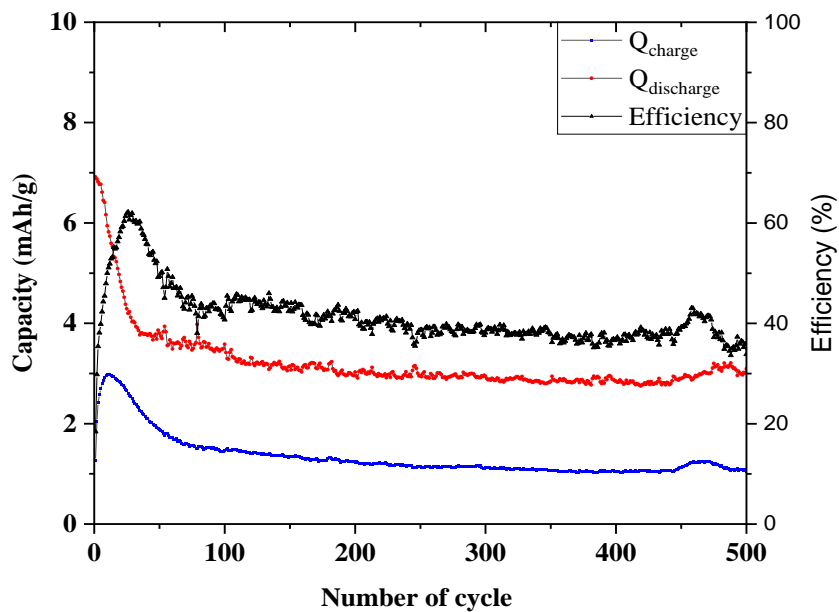


Figure S4. Capacity of RF in sodium acetate 1M at 10mV/s

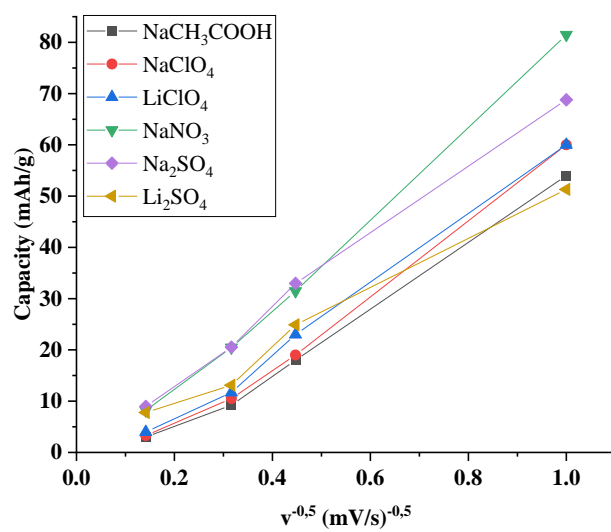


Figure S5. Evolution of capacity depending on scan rate and on the nature of the electrolyte salt.

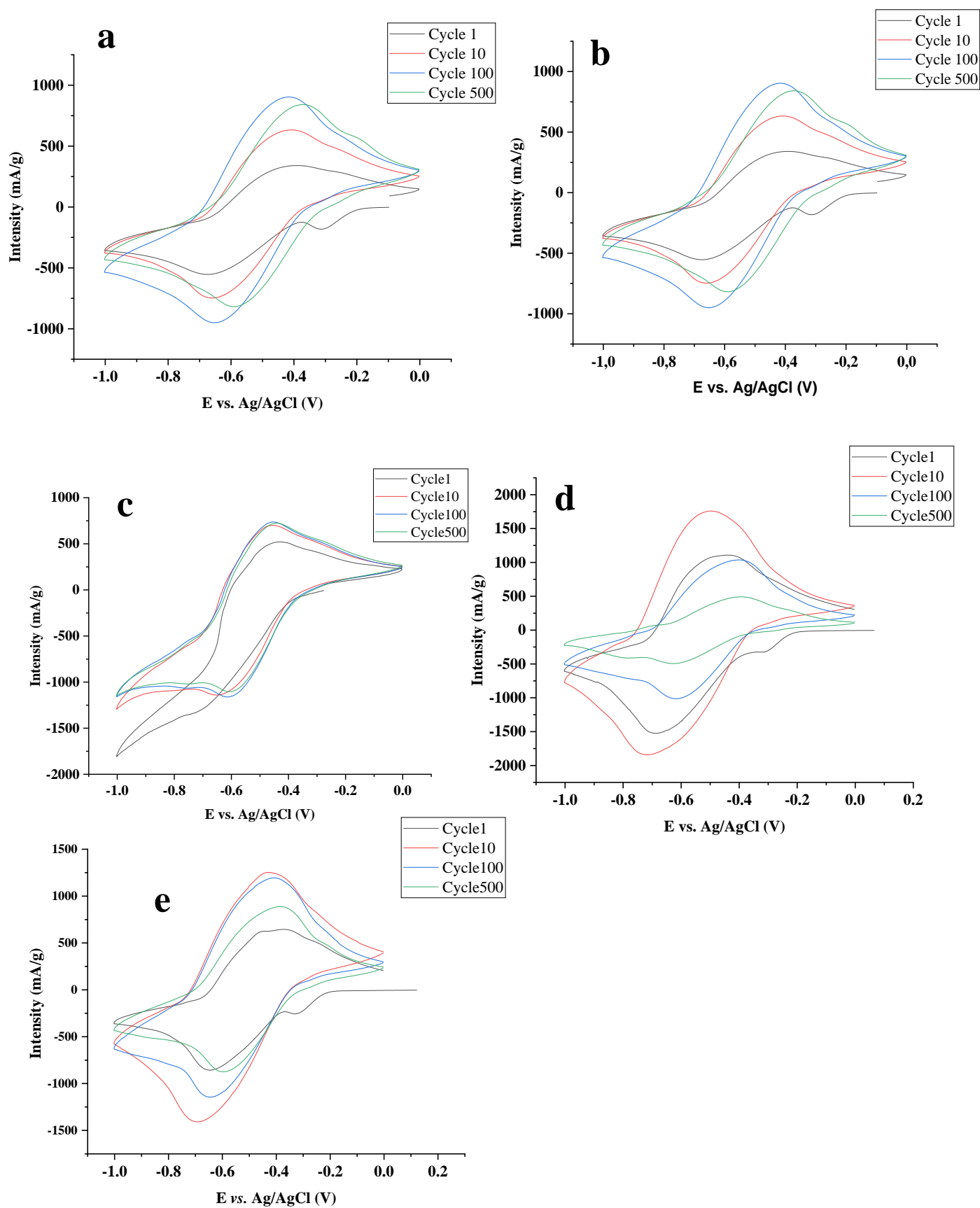


Figure S6. CV experiments of LDH-RF at 10mV/s in a 1M solution of (a) NaClO₄, (b) LiClO₄, (c) NaNO₃, (d) Na₂SO₄ and (e) Li₂SO₄

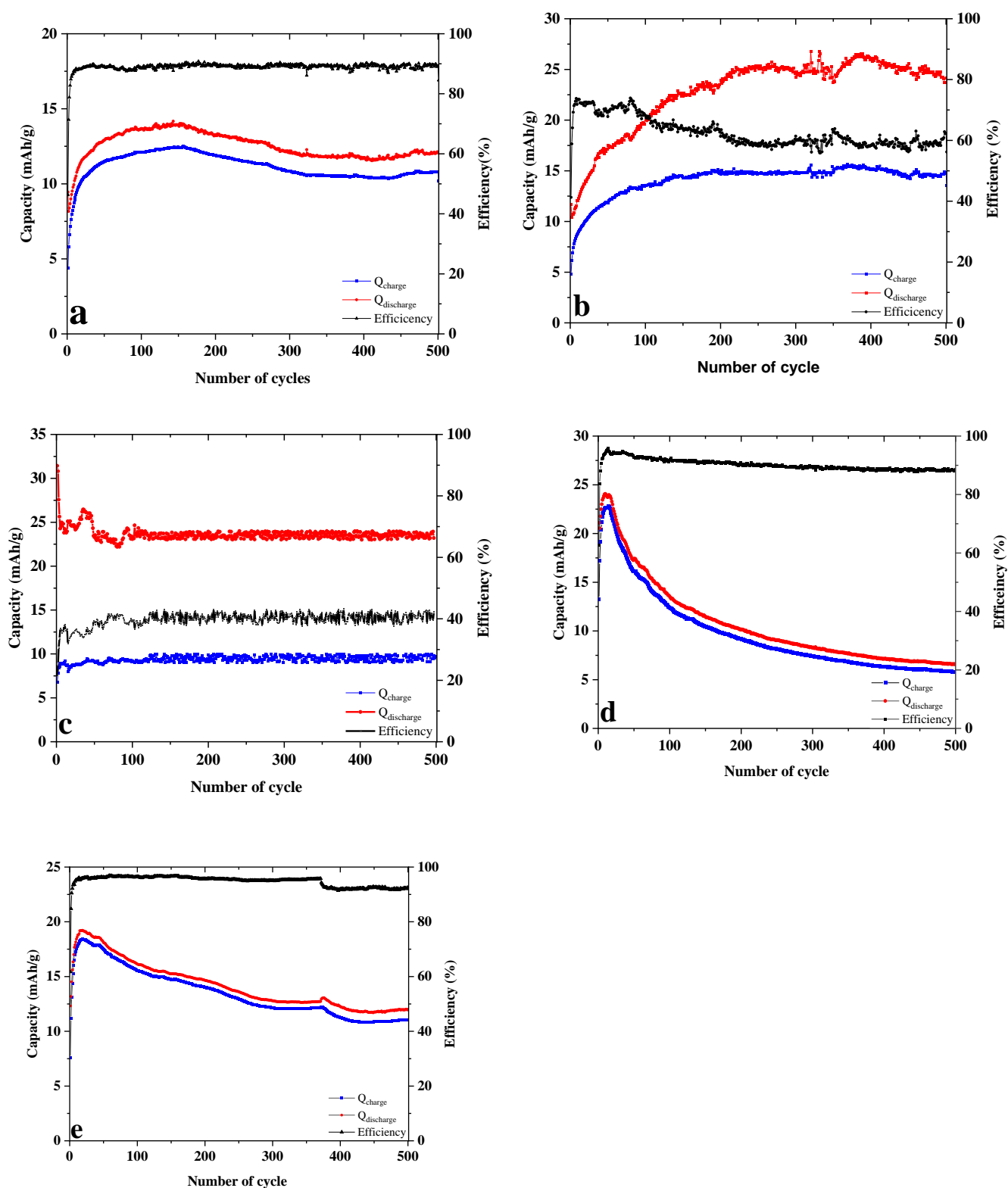


Figure S7. Capacity and efficiency of LDH-RF obtained at 10mV/s in a 1M solution of (a) NaClO₄, (b) LiClO₄, (c) NaNO₃, (d) Na₂SO₄ and (e) Li₂SO₄

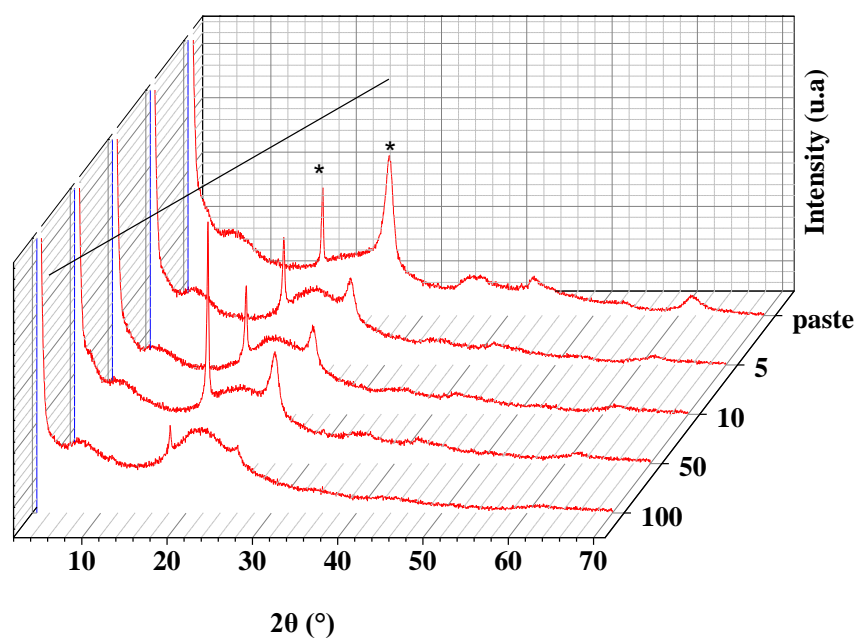


Figure S8. XRD of LDH-RF after 5th, 10th, 50th and 100th cycle in sodium acetate at 10mV/s

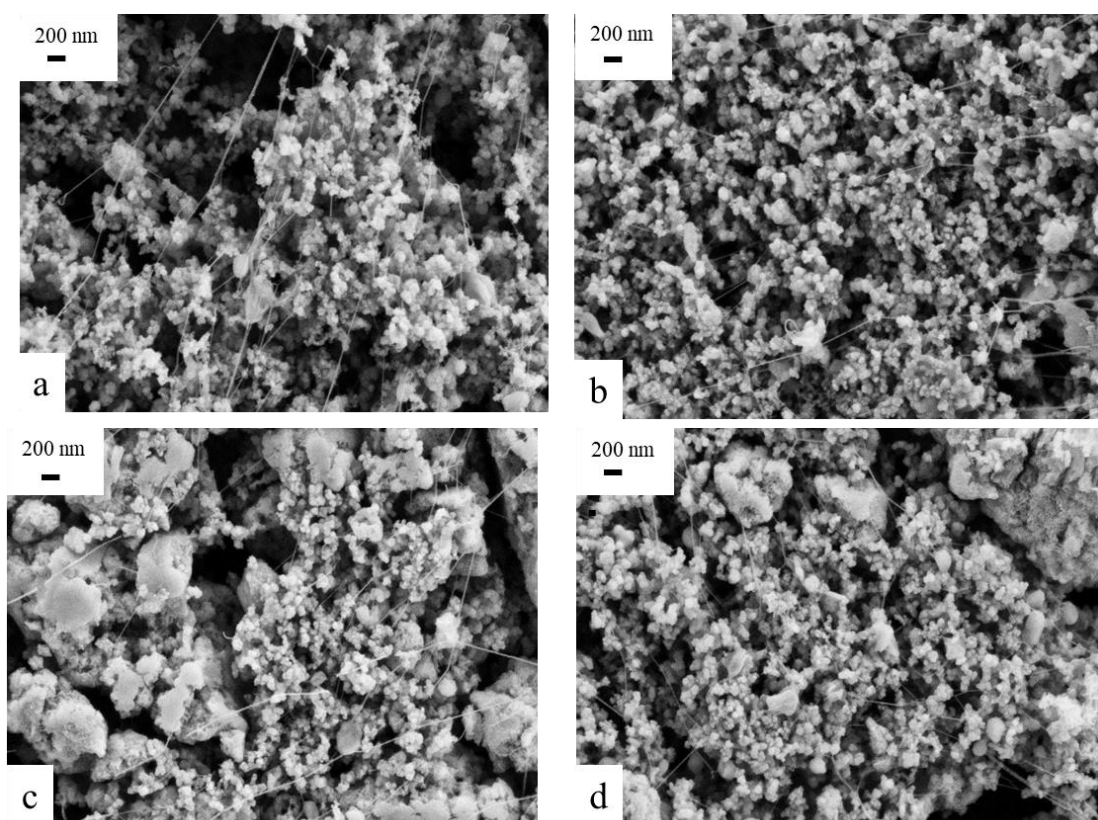


Figure S9. SEM images of LDH-RF paste (a) and post-mortem after 1st (b), 5th (c), 50th (d) cycle in sodium acetate at 10mV/s

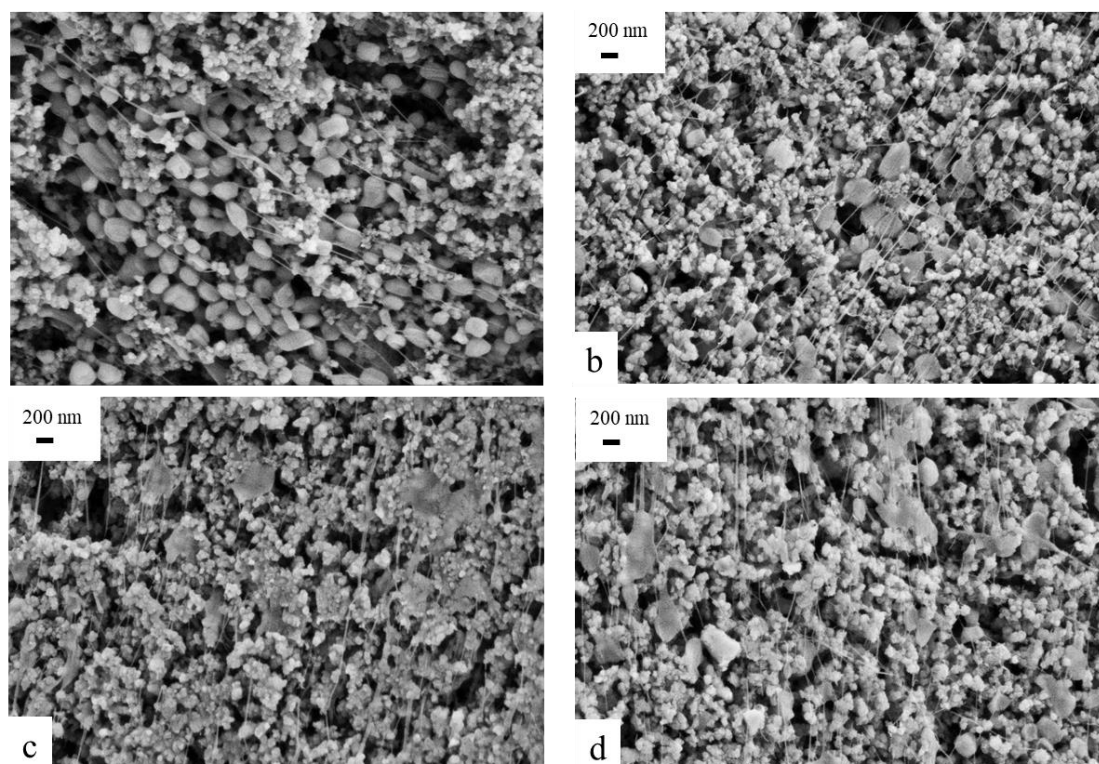
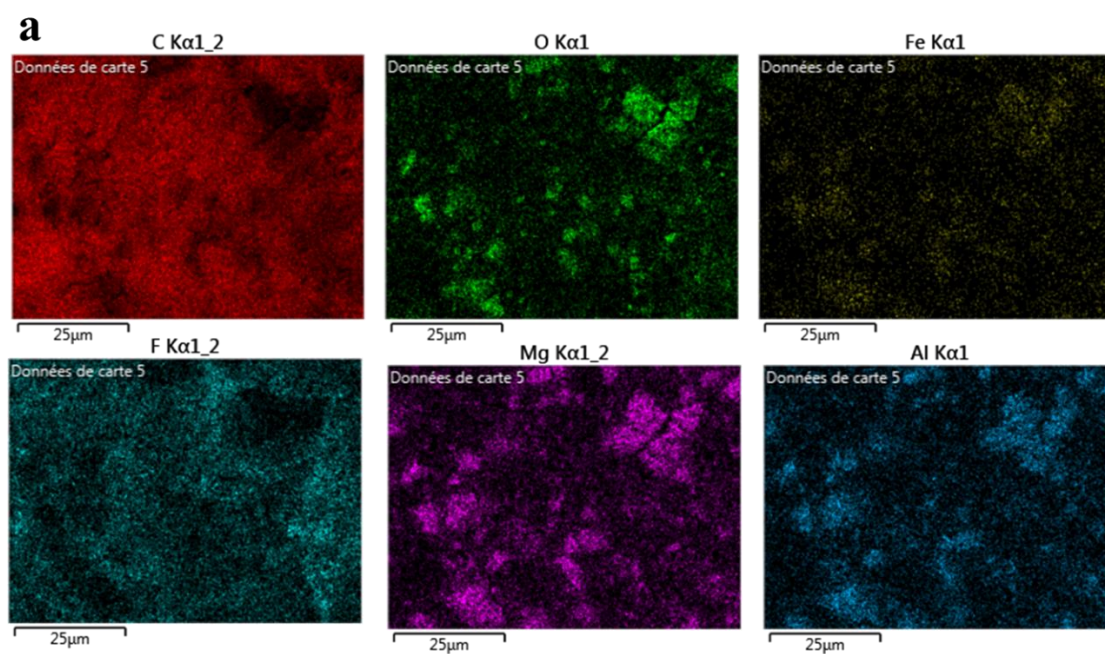
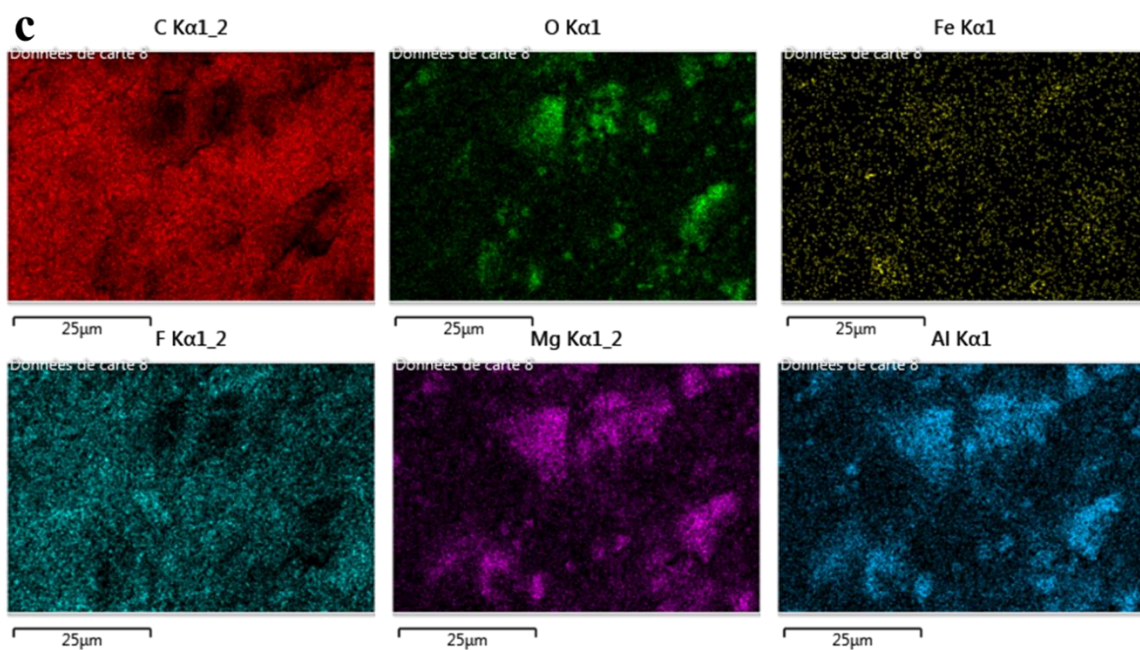
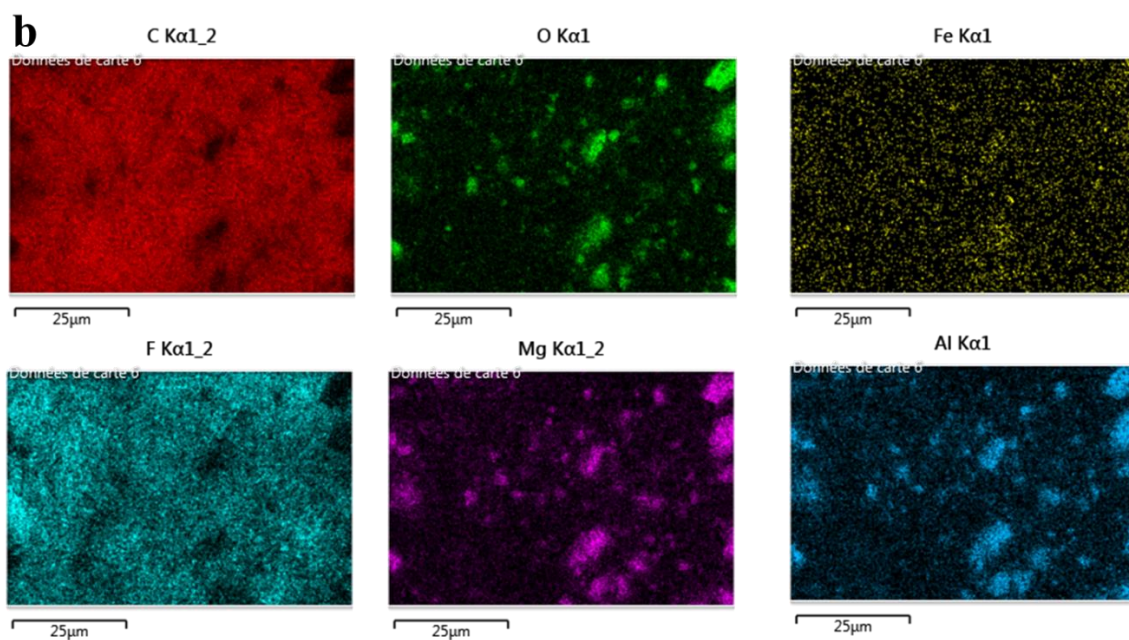


Figure S10. SEM images of LDH-FCm paste (a) and post-mortem after 1st (b), 5th (c), 50th (d) cycle in sodium acetate at 10mV/s





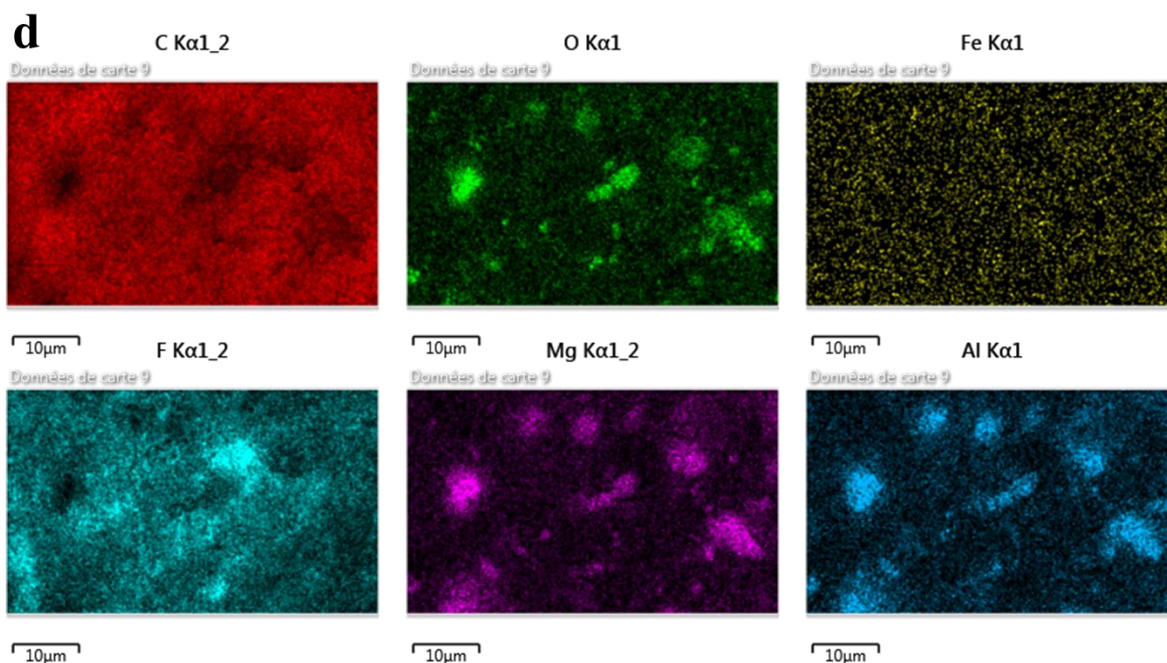


Figure S11. EDX mapping of (a) LDH-Fcm raw paste, LDH-FCm paste after (b) 1st cycle, (c) 5th cycle and (d) 50th in sodium acetate 1M at 10mV/s

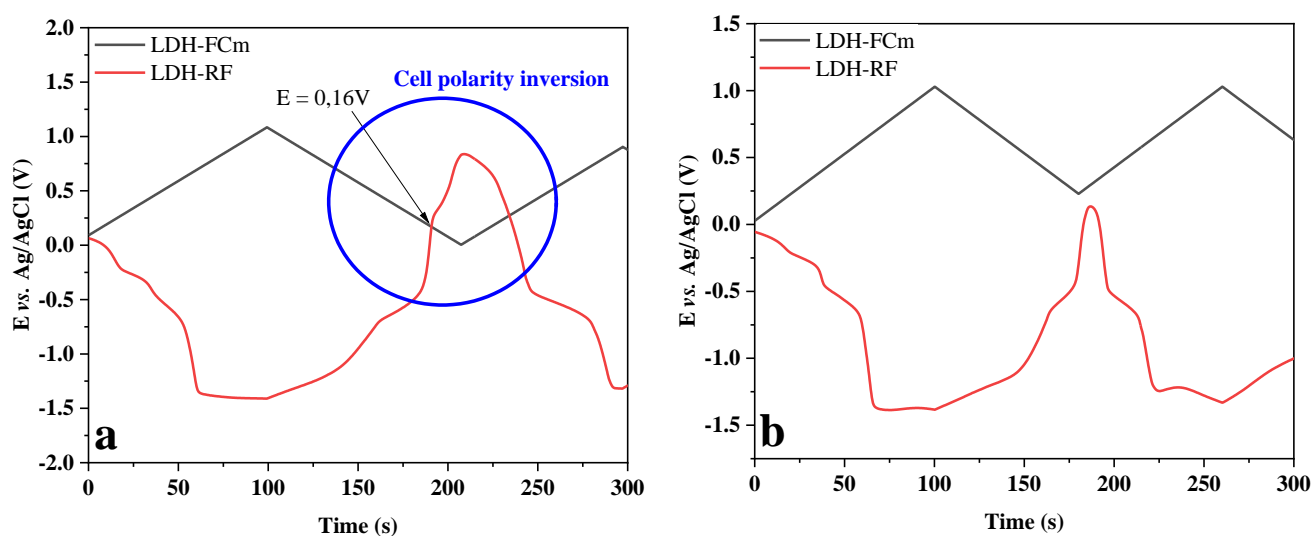


Figure S12. (a) Potential evolution of LDH-Fcm and LDH-RF electrodes in a complete cell with [0;1] V potential range imposed for LDH-Fcm in 1M sodium acetate at 10mV/s and (b) Potential evolution of LDH-Fcm and LDH-RF electrodes in a complete cell with [0,2;1] V potential range imposed for LDH-Fcm in 1M sodium acetate at 10mV/s

Table S1: Results of CV experiments of LDH-RF in different electrolyte at 1mV/s

<i>Electrolyte</i>	<i>Eox</i> (V)	<i>Ered</i> (V)	<i>Qc_{1st}</i> cycle	<i>Qd_{1st}</i> cycle	<i>Efficiency</i> (%)	<i>Qc_{25th}</i> cycle	<i>Qd_{25th}</i> cycle	<i>Efficiency</i> (%)
<i>NaCH₃COOH</i>	-0.49	-0.63	10.0	30.4	17	21.0	73.3	29
<i>NaClO₄</i>	-0.38	-0.60	16.4	70.0	23	19.0	55.6	34
<i>LiClO₄</i>	-0.32	-0.71	17.1	54.0	32	25.2	97.8	26
<i>NaNO₃</i>	-0.42	-0.58	8.0	81.4	10	/	/	/
<i>Na₂SO₄</i>	-0.57	-0.74	25.9	68.8	37	/	/	/
<i>Li₂SO₄</i>	-0.39	-0.74	28.1	51.2	55	10.3	24.7	41

Table S2: Results of CV experiments of LDH-FCd in different electrolyte at 1mV/s

<i>Electrolyte</i>	<i>Eox</i> (V)	<i>Ered</i> (V)	<i>Qc_{1st}</i> cycle	<i>Qd_{1st}</i> cycle	<i>Efficiency</i> (%)	<i>Qc_{5th}</i> cycle	<i>Qd_{5th}</i> cycle	<i>Efficiency</i> (%)
<i>NaCH₃COOH</i>	0.50	0.38	5.3	2.3	43	1.1	0.8	73
<i>NaClO₄</i>	0.55	0.42	9.0	2.9	32	4.0	3.4	86
<i>LiClO₄</i>	0.61	0.40	6.4	2.7	40	6.5	4.9	75
<i>Na₂SO₄</i>	0.65	0.51	14.3	2.5	18	4.8	2.1	46
<i>Li₂SO₄</i>	0.59	0.51	9.5	1.1	12	0.8	0.2	30

Table S3: Results of CV experiments of LDH-FCm in different electrolyte salts at 1mV/s

<i>Electrolyte</i>	<i>Eox</i> (V)	<i>Ered</i> (V)	<i>Qc_{1st}</i> cycle	<i>Qd_{1st}</i> cycle	<i>Efficiency</i> (%)	<i>Qc_{5th}</i> cycle	<i>Qd_{5th}</i> cycle	<i>Efficiency</i> (%)
<i>NaCH₃COOH</i>	0.38	0.29	59.9	38.8	65	6.2	0.9	15
<i>NaClO₄</i>	0.52	0.32	60.1	28.4	47	19.0	11.2	59
<i>LiClO₄</i>	0.62	0.22	60.6	24.0	40	25.5	18.7	72
<i>Na₂SO₄</i>	0.53	0.27	59.3	2.8	4.7	5.6	0.6	10
<i>Li₂SO₄</i>	0.48	0.28	57.6	0.5	0.8	4.0	0.4	10