Electronic Supplementary Information (ESI)

High performances $LiMnFePO_4$ / $Li_4Ti_5O_{12}$ full cell by functionalized polymeric additive

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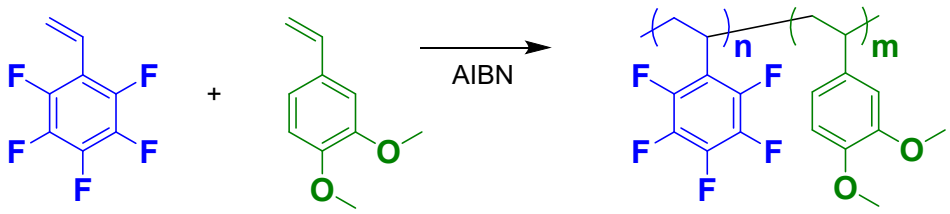

Scheme. S1. Free radical polymerization of pentaflurostyrene and 3,4-dimethoxybenzene

Incorporation of 3,4-dimethoxybenzene was calculated with this equation based on assignments reported[1]:

x = mol DMSt and y = mol PTFSt

6x = 6.00 (Ha) ∴ x = 1

3y + 3x = 6.20 ∴ y = 1.07

(x / (x +y)) x 100 = 48 mol% of DMSt

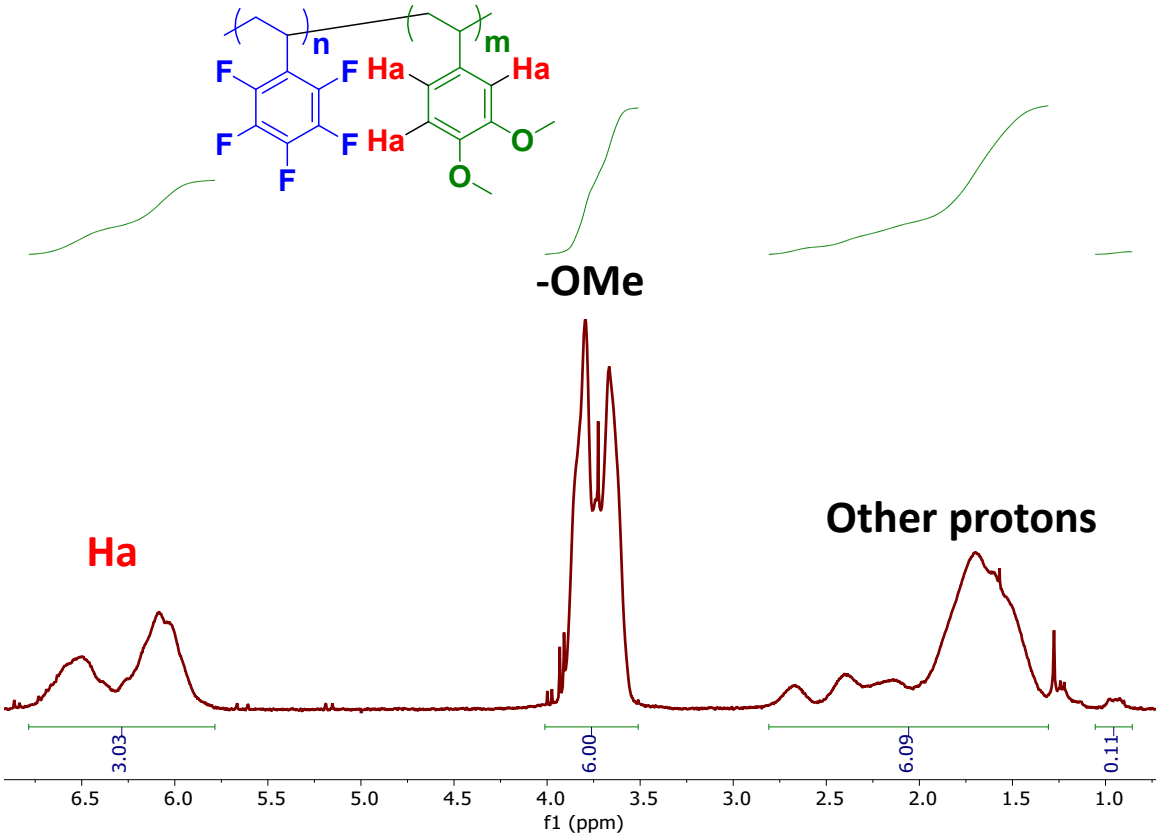

Fig. S1. ^{1}H NMR spectrum of poly(pentafluorostyrene-co-3,4-dimethoxybenzene)

Molecular Weight Averages

Peak	Mp (g/mol)	Mn (g/mol)	Mw (g/mol)	Mz (g/mol)	Mz+1 (g/mol)	Mv (g/mol)	PD
Peak 1	35788	26216	43611	69132	103255	63076	1.664

Distribution Plot

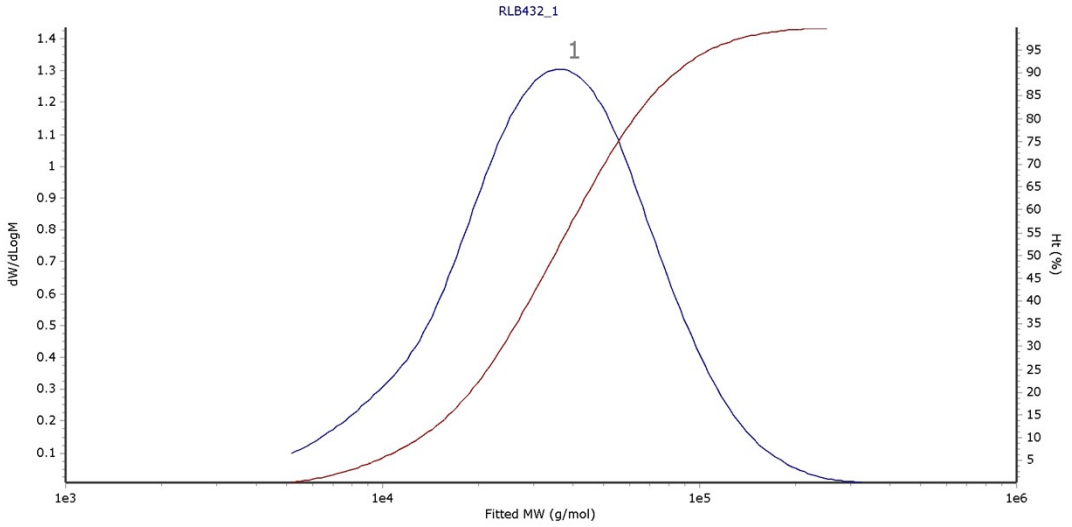

Figure S2. GPC trace of polymer

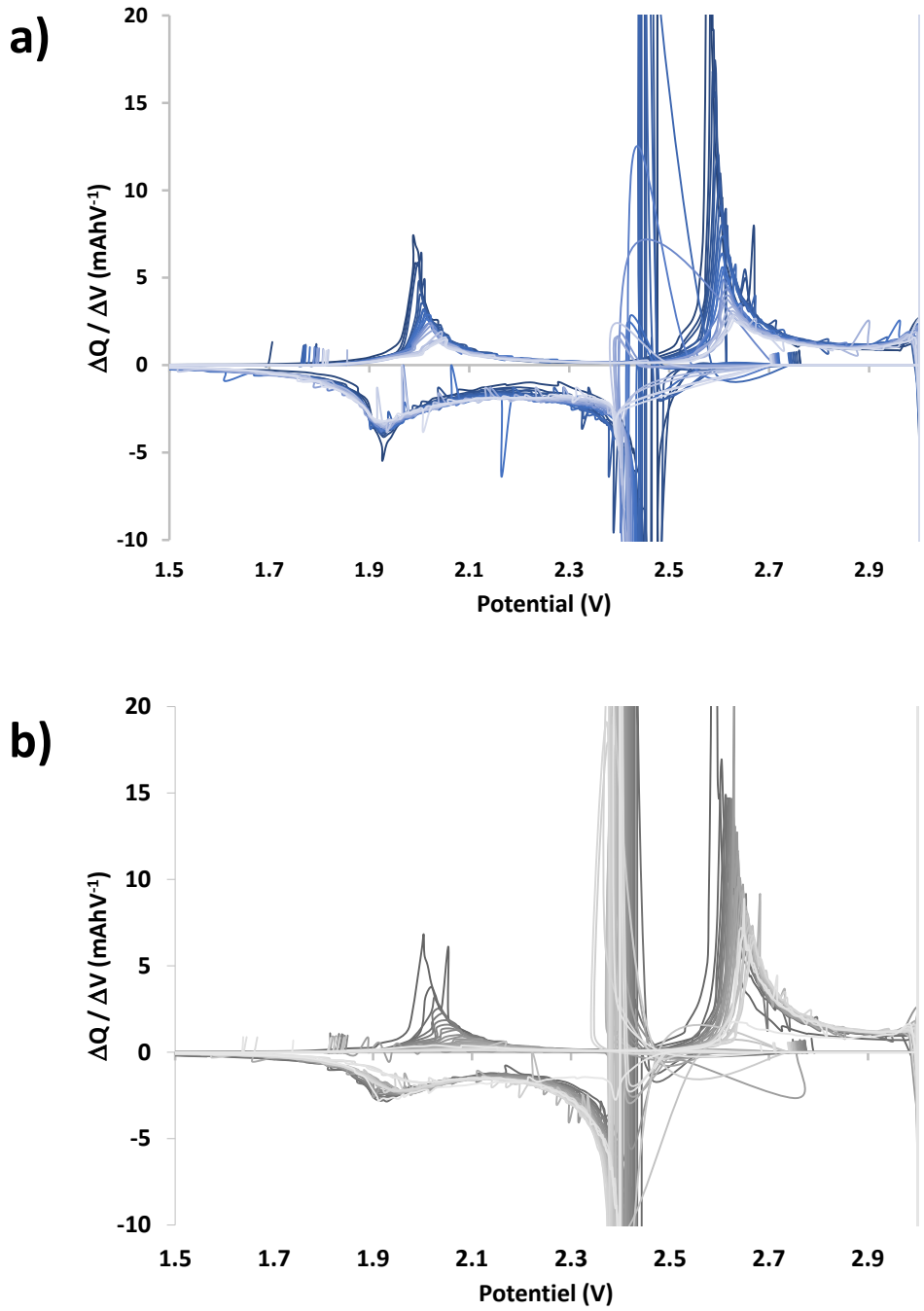

Figure S3. Derivatives dQ/dV in function of potential. a) 1% polymer. b) PVDF

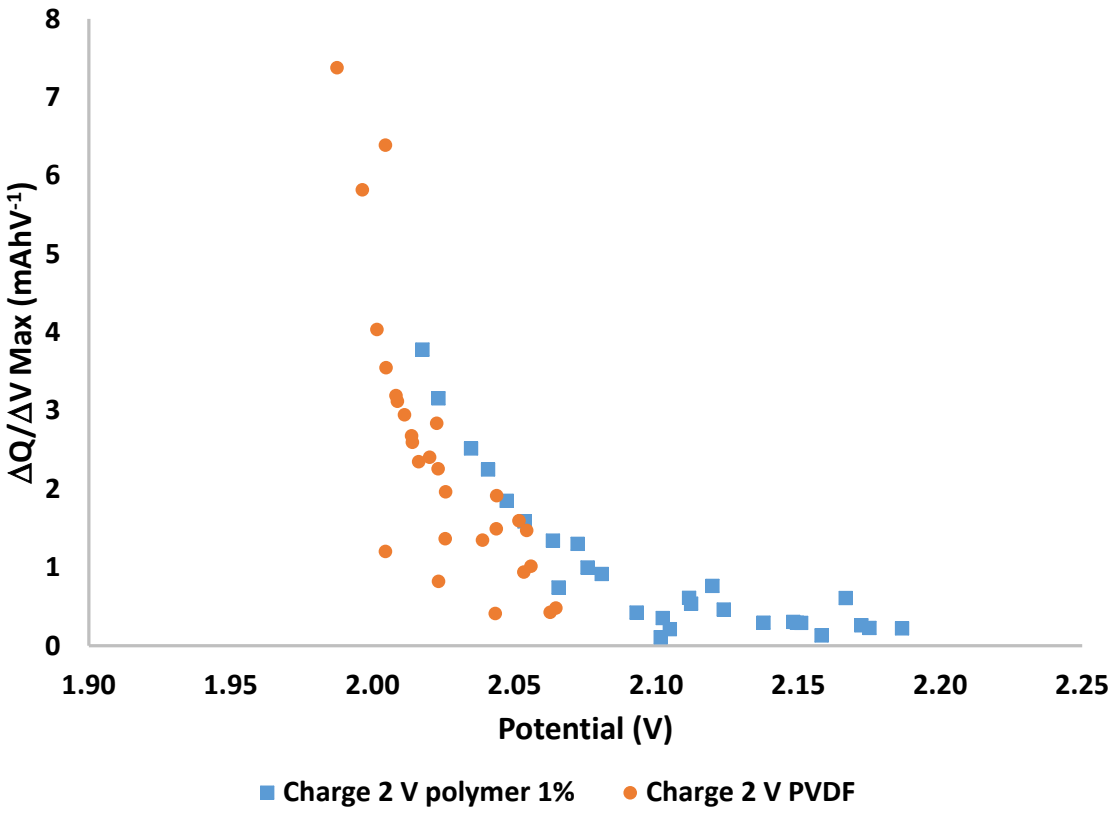

Figure S4. Variation of dQ /dV after charging at 2 V.

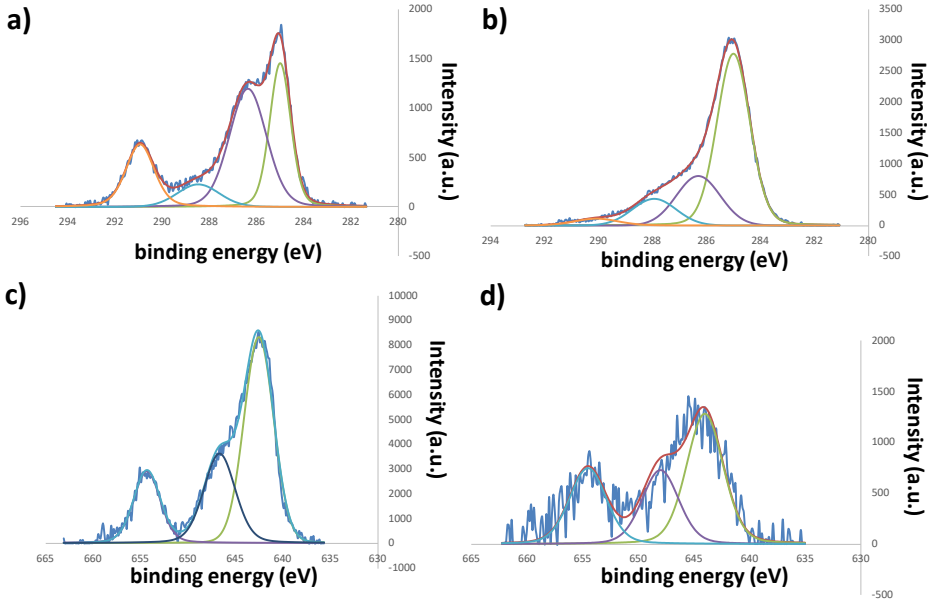

Figure S5. XPS analysis. a) HR C1s spectrum PVDF. b) HR C1s spectrum 1% polymer. c) HR Mn2p3/2 spectrum PVDF. d) HR Mn2p3/2 spectrum 1% polymer.

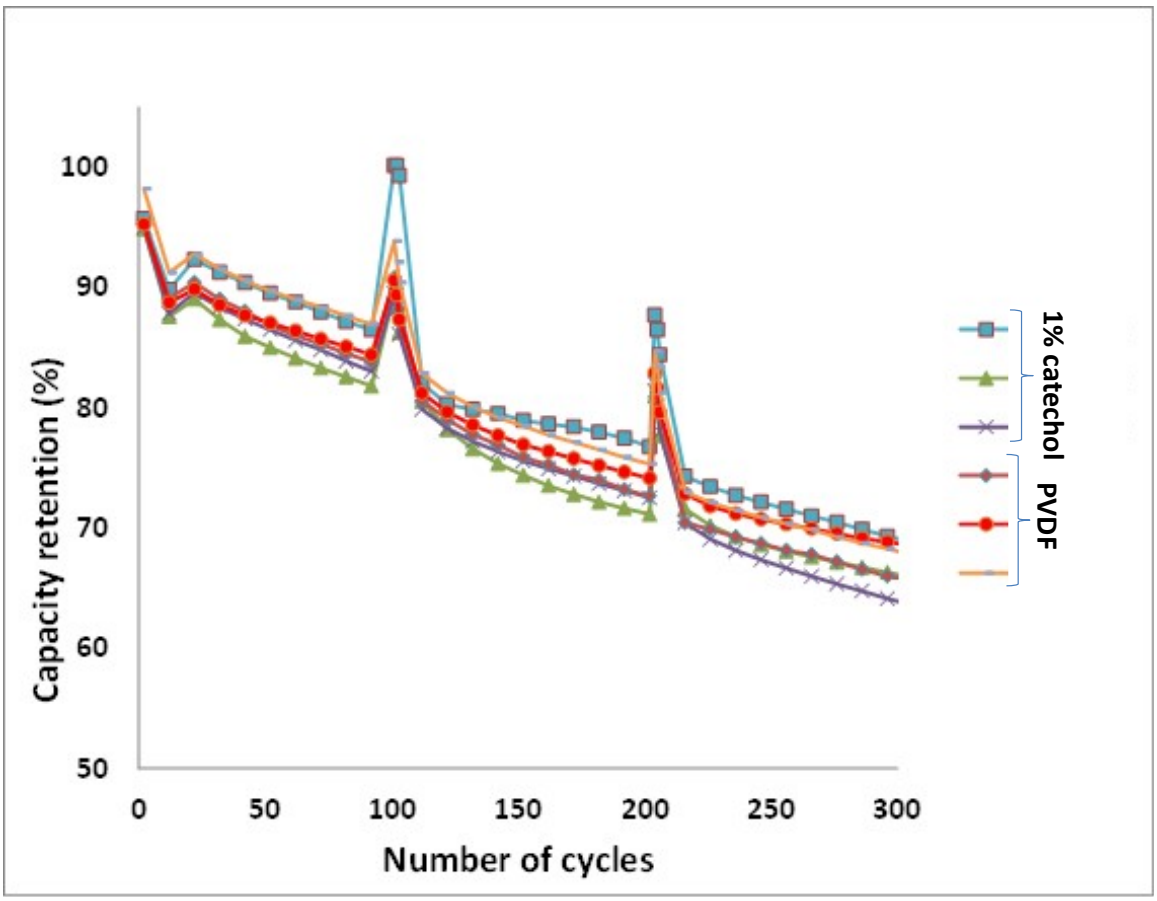

Figure S6. Cycle-life of catechol based polymer (45 °C, 1 C)

[1] G. Westwood, T.N. Horton, J.J. Wilker, Simplified Polymer Mimics of Cross-Linking Adhesive Proteins, Macromolecules, 40 (2007) 3960-3964.

Table S1. Value extracted from impedance measurement performed for reference battery and with 1% of additive after formation, 150 cycles and 250 cycles. R1, C1 correspond to charge transfer resistance and associated capacitance. R2, C2 correspond to adsorbed layer at the surface of negative electrode. These attributions are performed due to value of capacitance.

Samples	PVDF ref			Additive 1%		
Cycle number	formation	150 cycles	250 cycles	formation	150 cycles	250 cycles
R1 (Ohm)	1.9	2.4	7.6	4.3	19.0	21.6
C1 ($F.s^{-1}$)	1.4 E-6	3.6 E-6	2.0 E-6	1.7 E-6	2.0 E-6	2.2 E-6
R2 (Ohm)	1.2	5.6	4.5	1.1	2.0	18.3
C2 ($F.s^{-1}$)	7.8 E-4	2.0 E-5	8.0 E-5	9.4 E-4	1.3 E-3	6.6 E-4