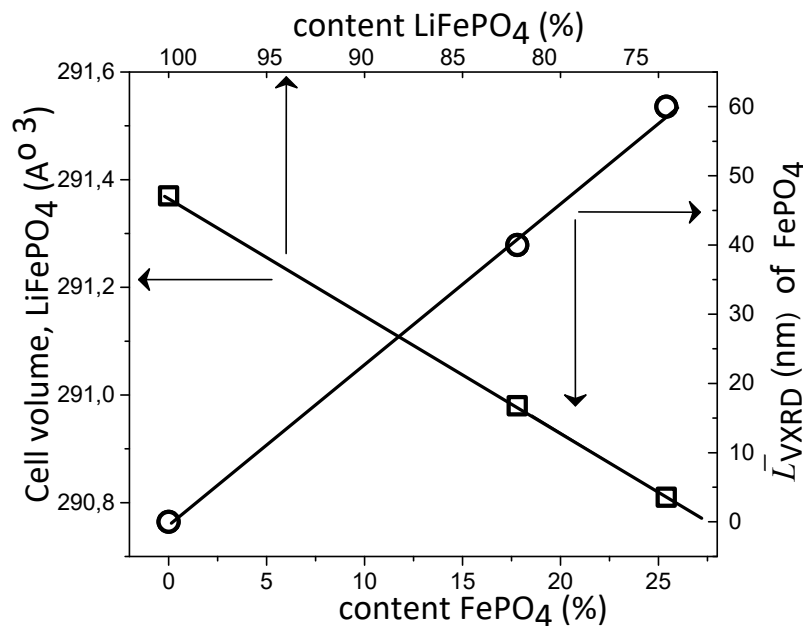


**Figure S1.** The dependence of the LiFePO<sub>4</sub> orthorhombic olivine structure unit cell volume on the values of Li deficiency and Fe excess relative to the stoichiometric composition according to ICDD identification 01-083-9048, 01-083-9049, 01-083-9050, their numbers are indicated. [1]

[1] Jensen, K.M.Ø.; Christensen, M.; Gunnlaugsson, H.P.; Lock, N.; Bøjesen, E.D.; Proffen, T.; Iversen, B.B. Defects in Hydrothermally Synthesized LiFePO<sub>4</sub> and LiFe<sub>1-x</sub>Mn<sub>x</sub>PO<sub>4</sub> Cathode Materials. *Chem. Mater.* **2013** *25*, 2282–2290. [dx.doi.org/10.1021/cm4008393](https://doi.org/10.1021/cm4008393)

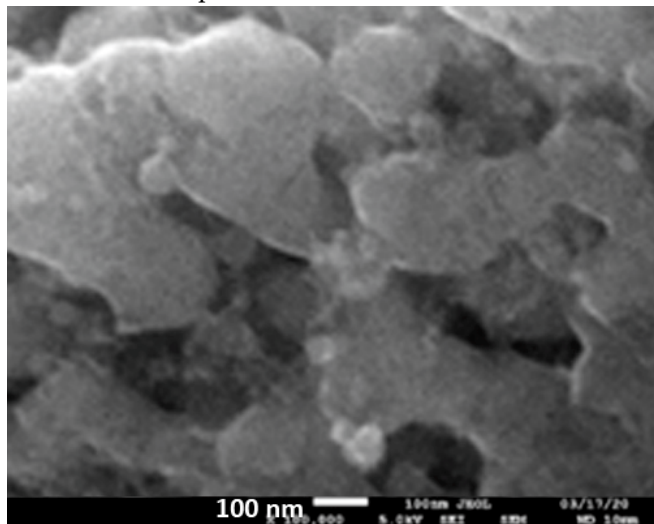


**Figure S2.** The results of XRD measurements of N1 test cathode depending on its discharge degree. The left ordinate is the volume of the unit cell of non-discharged LiFePO<sub>4</sub> crystallites, the right ordinate is the average size of the discharged FePO<sub>4</sub> crystallites.

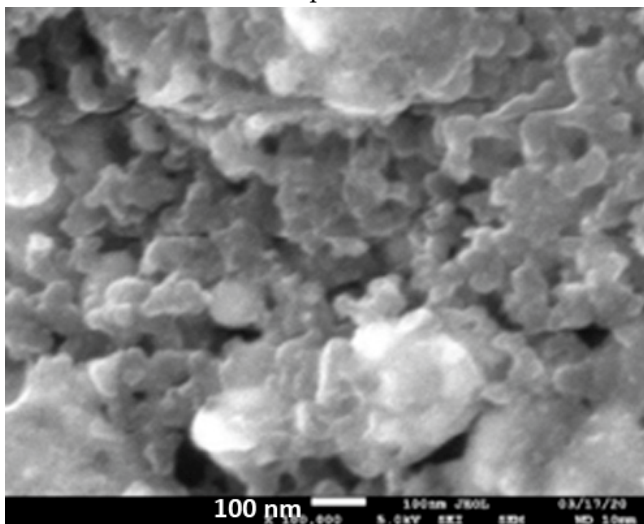
## Section S1. SEM and EDX studies of samples before and after 100-fold cycling of test cathodes made from developed and commercial powders

SEM JSM-7001F with Energy Dispersive X-Ray Analysis (EDX) is used.

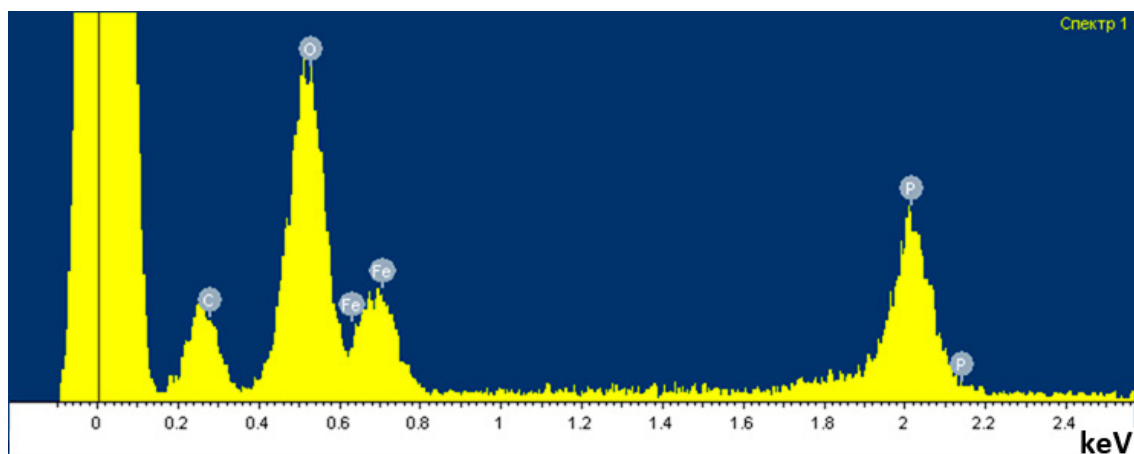
1 smpl. Before



1 smpl. After

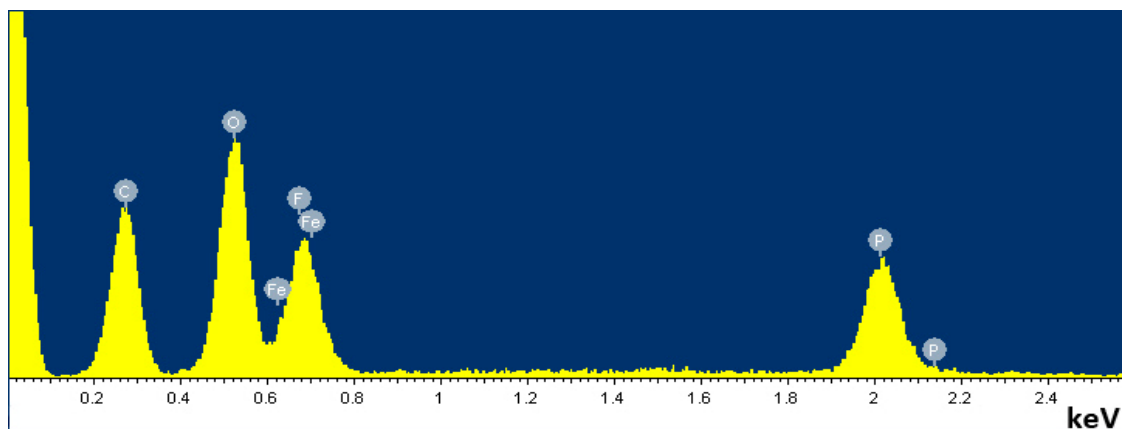


1 smpl. Before



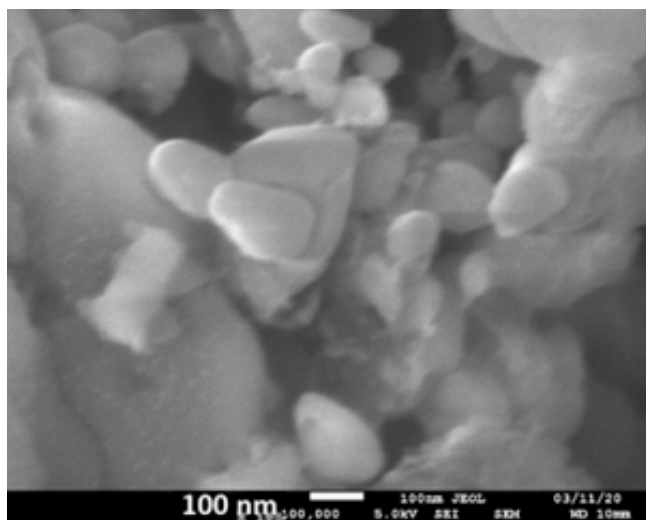
Element	Conv.	Intensity Correct.	Weight %	Sigma	Atomic %
C K	13.39	0.7228	21.62	1.13	38.41
O K	31.44	1.3085	28.06	1.01	37.42
P K	9.46	0.6859	16.10	0.68	11.09
Fe K	23.99	0.8184	34.22	1.81	13.07
Total			100.00		

1 smpl. After

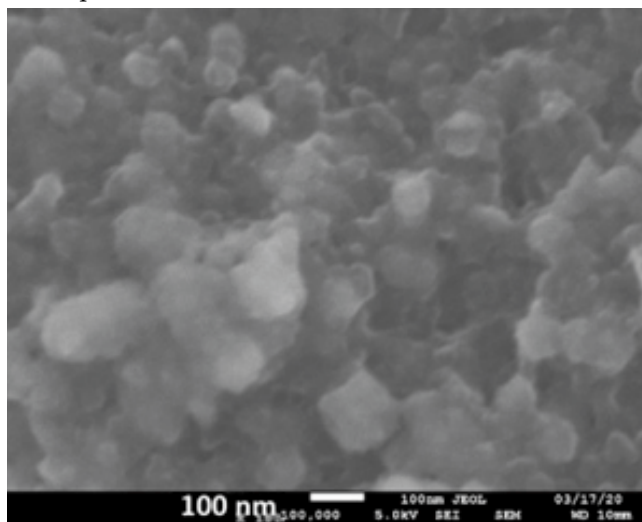


Element	Conv.	Intensity Correct.	Weight %	Weight % Sigma	Atomic %
t	Conc.				
C K	31.94	0.8478	31.05	0.71	46.12
O K	34.60	1.1970	23.82	0.54	26.57
F K	11.93	0.6260	15.71	0.74	14.75
P K	10.02	0.6717	12.30	0.34	7.08
Fe K	16.17	0.7781	17.12	1.07	5.47
Total			100.00		

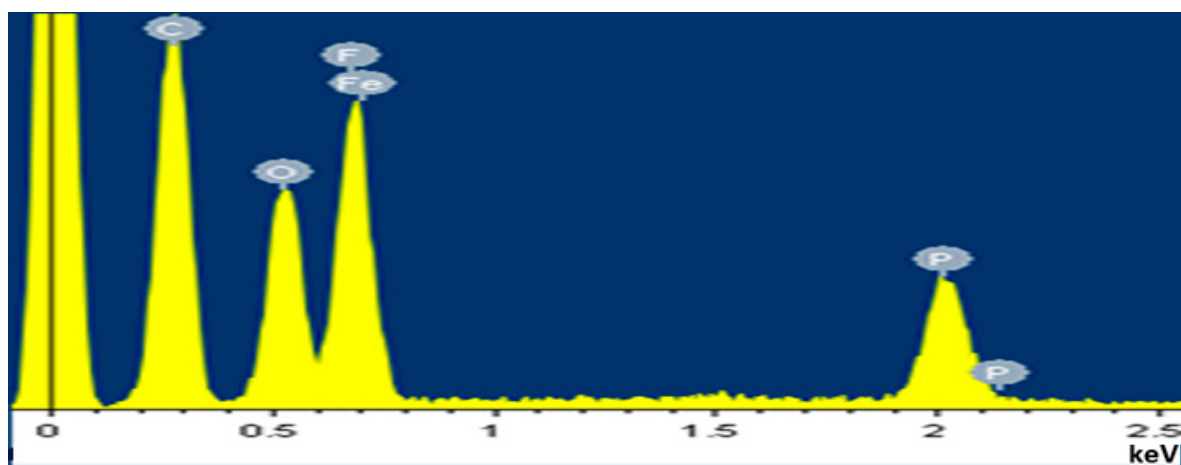
3 smpl. Before



3 smpl. After

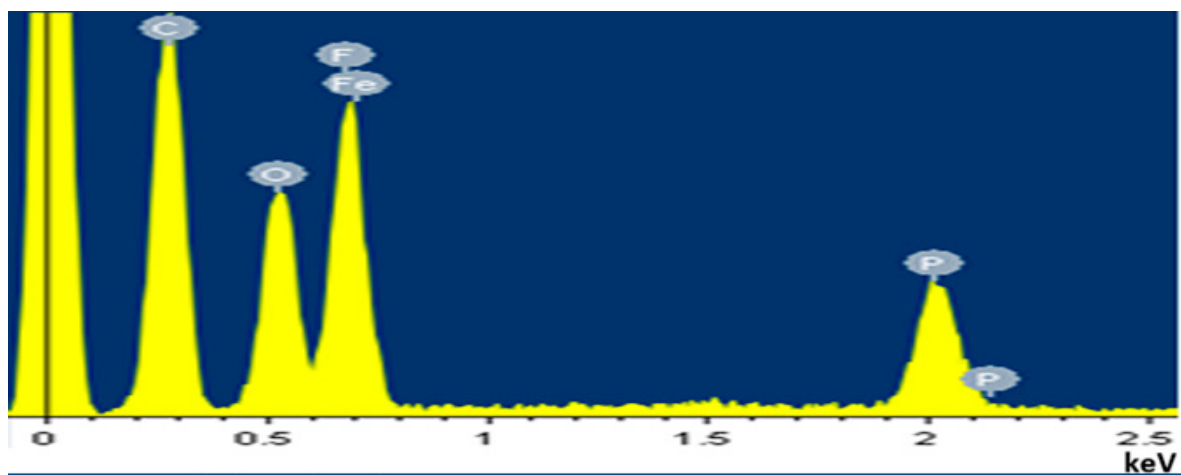


3 smpl. Before



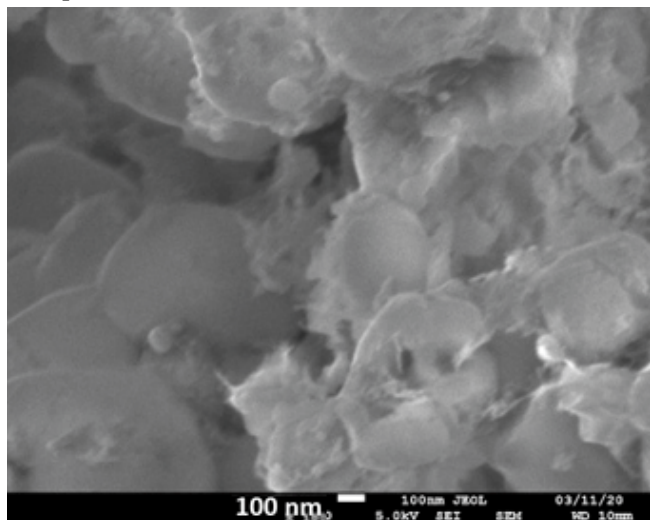
Element	Conv Conc.	Intensity Correct.	Weight %	Weight % Sigma	Atomic %
C K	25.86	0.8343	38.10	1.35	57.31
O K	21.00	1.0890	23.73	0.97	26.80
P K	7.47	0.6754	13.60	0.63	7.94
Fe K	15.66	0.7838	24.58	1.92	7.95
Total			100.00		

3 smpl. After

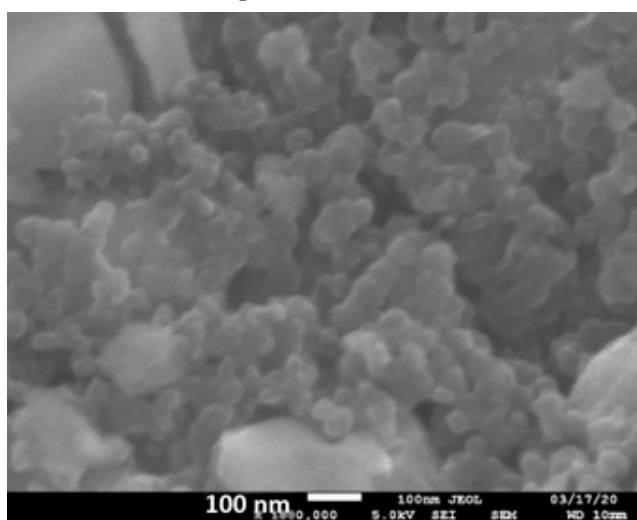


Element	Conv Conc.	Intensity Correct.	Weight %	Weight % Sigma	Atomic %
C K	42.00	0.9837	39.41	0.78	53.74
O K	19.14	1.1051	16.00	0.46	16.38
F K	18.52	0.6604	25.92	0.75	22.34
P K	6.27	0.6640	8.73	0.30	4.61
Fe K	8.18	0.7598	9.94	1.08	2.92
Total			100.00		

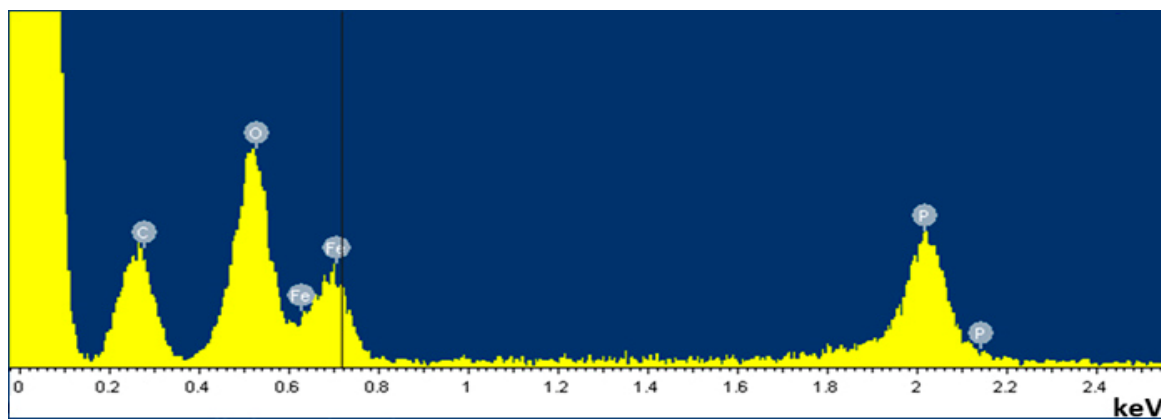
4 smpl. Before



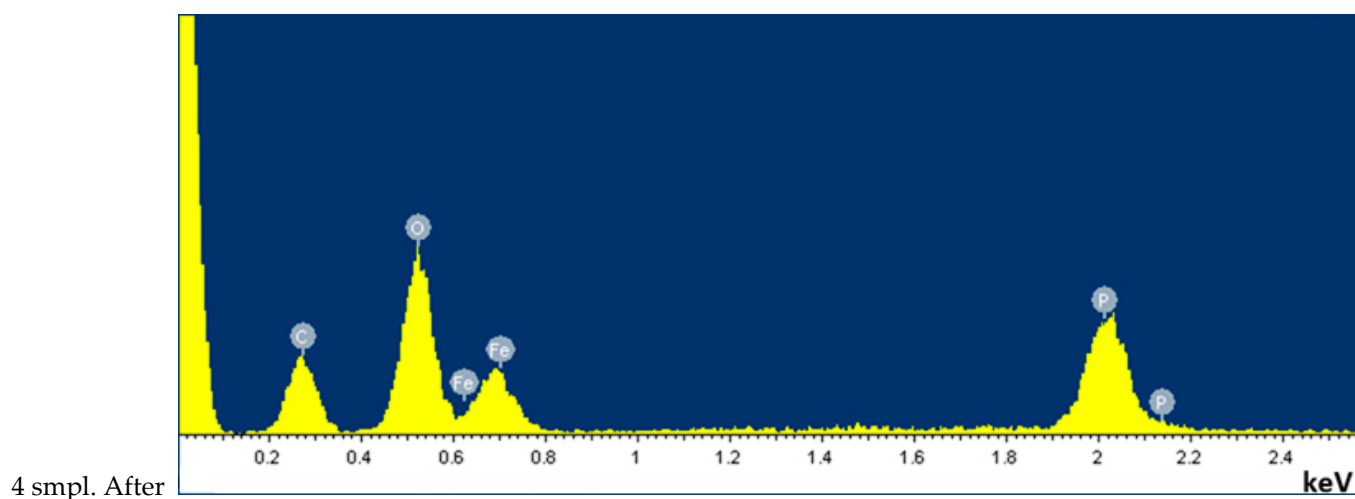
4 smpl. After



4 smpl. Before



Element	Conv.	Intensity Correct.	Weight %	Weight % Sigma	Atomic %
C K	18.16	0.7755	30.07	1.33	49.73
O K	22.21	1.1919	23.95	0.99	29.74
P K	7.74	0.6818	14.59	0.68	9.36
Fe K	19.67	0.8052	31.39	2.02	11.17
Total			100.00		



Element	Conv .	Intensity Correct.	Weight %	Weight % Sigma	Atomic %
C K	12.36	0.7003	24.19	0.91	42.55
O K	22.64	1.2497	24.84	0.76	32.80
P K	8.86	0.6874	17.68	0.59	12.06
Fe K	19.83	0.8167	33.29	1.56	12.59
Total			100.00		