Supporting Information for *Acta Phys. -Chim. Sin.* doi: 10.3866/PKU.WHXB201811033

氟代碳酸乙烯酯添加剂对钠离子电池正极的影响

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Fluoroethylene Carbonate as an Additive for Sodium-ion Batteries: Effect on the Sodium Cathode

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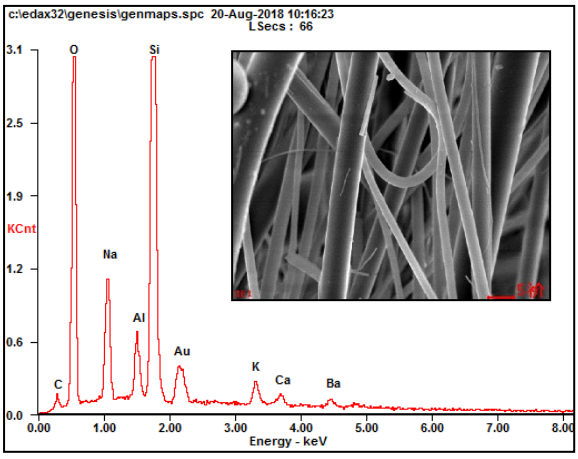
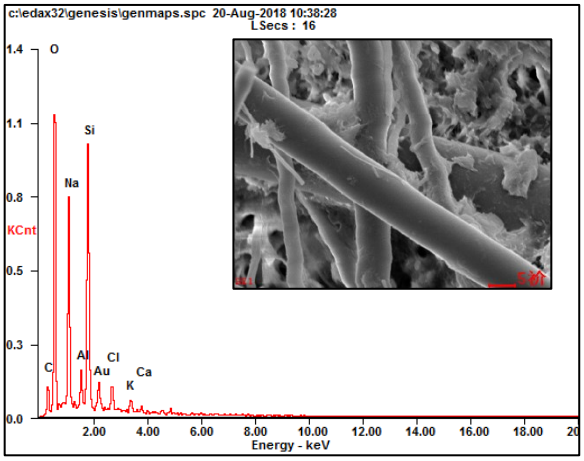
(a)



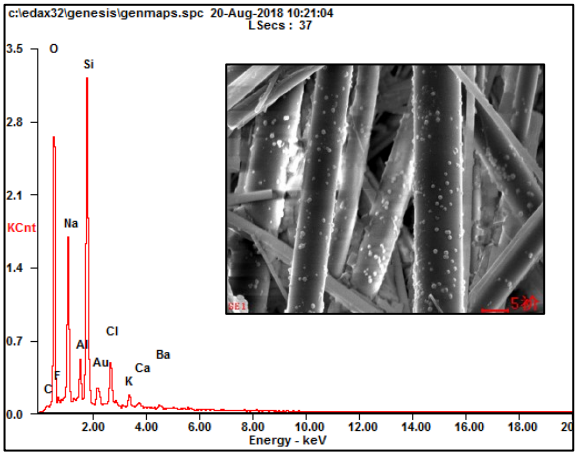
Element	Wt%	At%
CK	02.57	05.28
OK	26.40	40.65
NaK	07.63	08.17
AlK	04.15	03.79
SiK	40.35	35.39
KK	04.85	03.05
CaK	02.64	01.62
BaL	11.41	02.05
Matrix	Correction	ZAF

(b)



Element	Wt%	At%
CK	07.31	13.72
OK	30.78	43.34
NaK	14.08	13.80
AlK	02.73	02.28
SiK	24.93	20.00
AuM	10.84	01.24
ClK	04.64	02.95
KK	02.80	01.61
CaK	01.89	01.06
Matrix	Correction	ZAF

(c)



Element	Wt%	At%
CK	01.30	02.58
OK	28.62	42.70
FK	00.97	01.22
NaK	11.92	12.37
AlK	03.50	03.10
SiK	33.02	28.07
ClK	08.15	05.49
KK	03.40	02.08
CaK	01.92	01.14
BaL	07.20	01.25
Matrix	Correction	ZAF

Fig. S1 EDX spectrum of the glass separator (a): pristine, (b): after 20 cycles without and with 3% FEC (c).

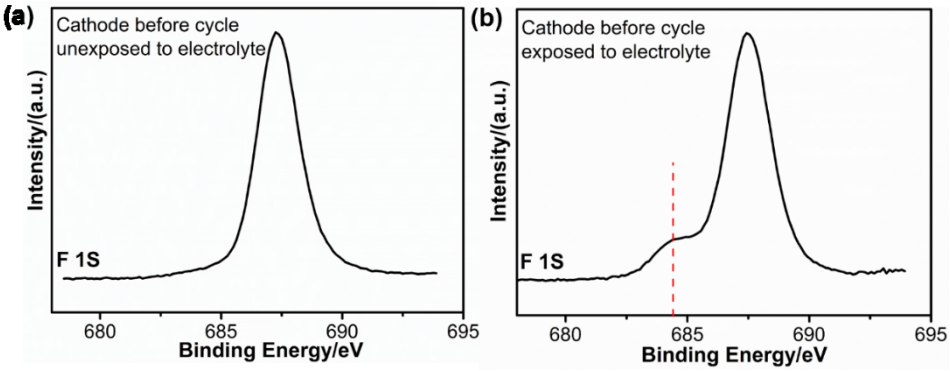


Fig. S2 F 1*s* X-ray photoelectron spectra of pristine P2-$Na_xCo_{0.7}Mn_{0.3}O_2$ unexposed to electrolyte (a), exposed to electrolyte (b).

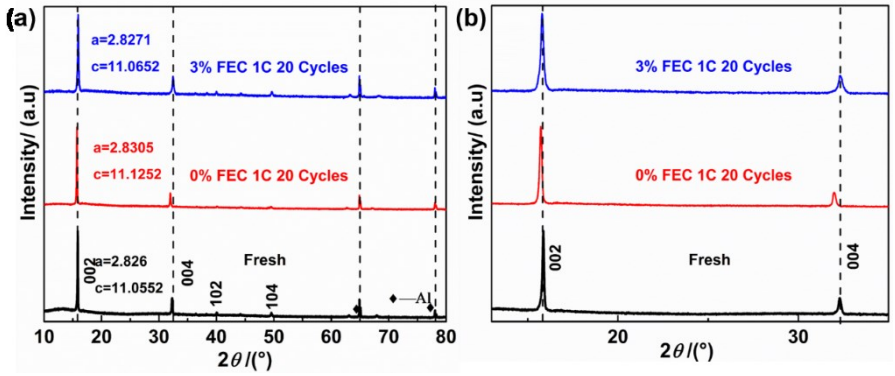


Fig. S3 XRD spectra (a), and enlarged comparison spectra (b) of the cathode in electrolytes with and without FEC after cycling.

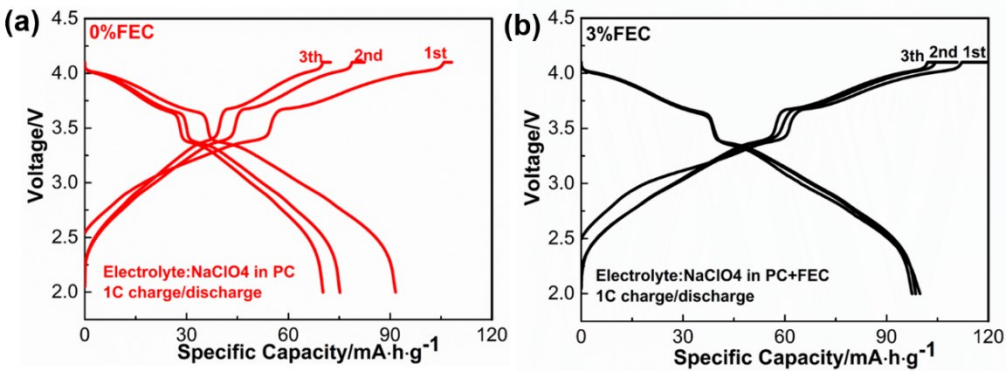


Fig. S4 The initial three charge/discharge profiles of the P2-$Na_xCo_{0.7}Mn_{0.3}O_2$ *vs* Na^+/Na at a current rate of 1*C* in FEC-free (a) and 3% FEC-containing (b) electrolyte.

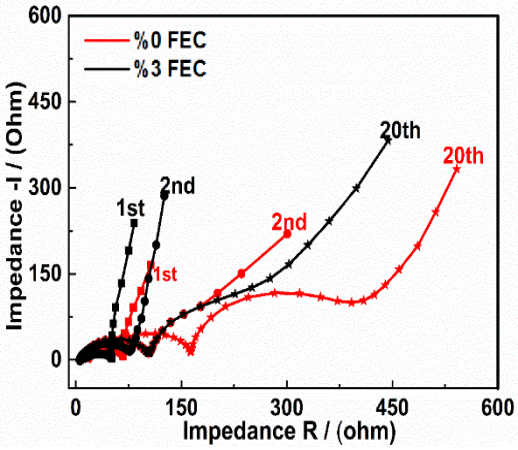
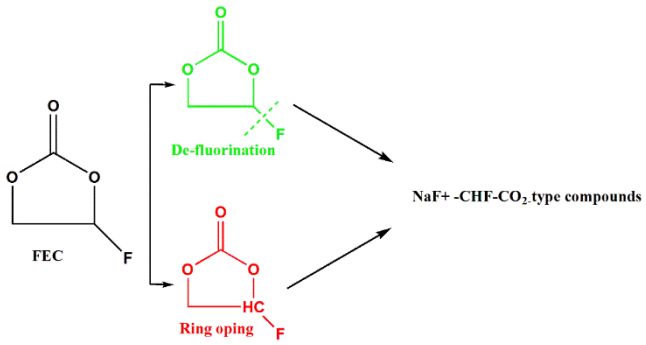


Fig. S5 Impedance spectra obtained at different cycles using a three electrode cell.



Scheme 1 Possible FEC decomposition patterns and products.