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Development of new anode composite materials for Fluoride Ion Batteries

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Supporting information

Table S1. Some theoretical properties of various redox couples used as electrode in this study. Note the specific theoretical capacity is referred to the mass of metal as the experimental capacity values given in the manuscript are calculated with respect to the active metal mass in the cathode composite.

Redox couple	Theoretical specific capacity (mAh.g(metal)$^{-1}$)	Electromotive force (V vs. Ce/CeF_3)	Volume change $M \rightarrow MF_x$ (%)
Bi/BiF_3	385	2.66	+59
BiF_3/BiF_5	217	-	+10
Cu/CuF_2	843	3.00	+192
Ce/CeF_3	573	0	+57
Ca/CaF_2	1337	-0.50	-7
Mg/MgF_2	2206	+0.02	+40

Figure S1. Scanning Electron micrograph of the cross-section of a three-layer pellet used for electrochemical measurements.

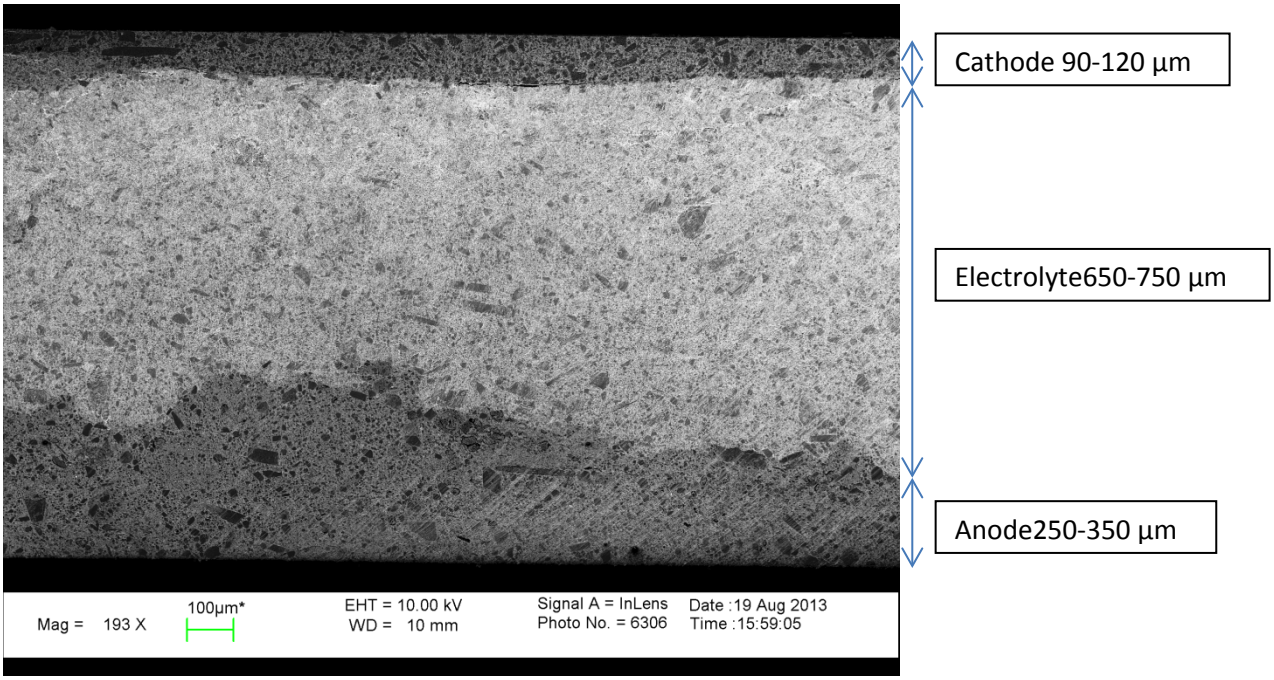

Figure S2. XRD patterns of starting Bi and Cu powders.

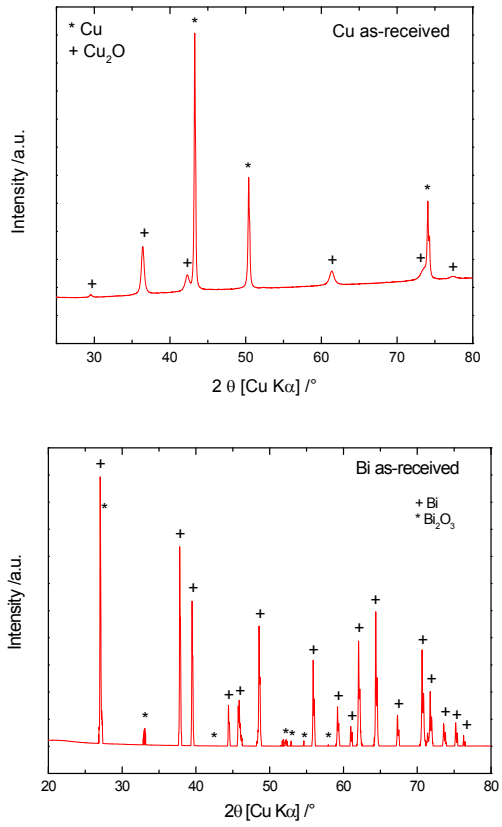

Figure S3. First charge curves of the cells (a) Bi/$La_{0.9}Ba_{0.1}F_{2.9}$/CeF_3, Bi/$La_{0.9}Ba_{0.1}F_{2.9}$/CaF_2, Bi/$La_{0.9}Ba_{0.1}F_{2.9}$/MgF_2charged to 3.5 V and (b) Bi/$La_{0.9}Ba_{0.1}F_{2.9}$/CeF_3, Bi/$La_{0.9}Ba_{0.1}F_{2.9}$/CaF_2, Bi/$La_{0.9}Ba_{0.1}F_{2.9}$/Mg+MgF_2 charged to 4V.