**Supporting Information**

**Towards the High-performance Lithium Primary Batteries by Chemically Modified Fluorinate Carbon with δ-MnO2**

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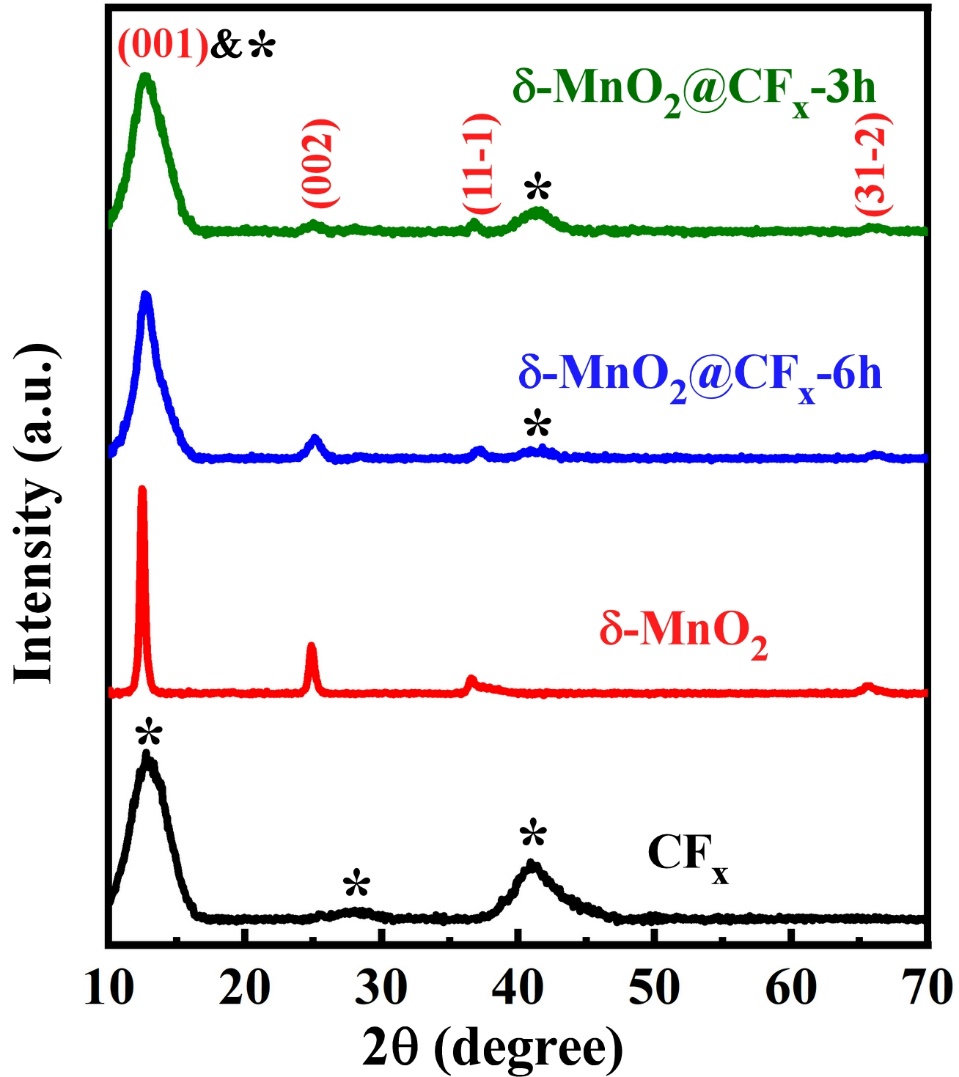
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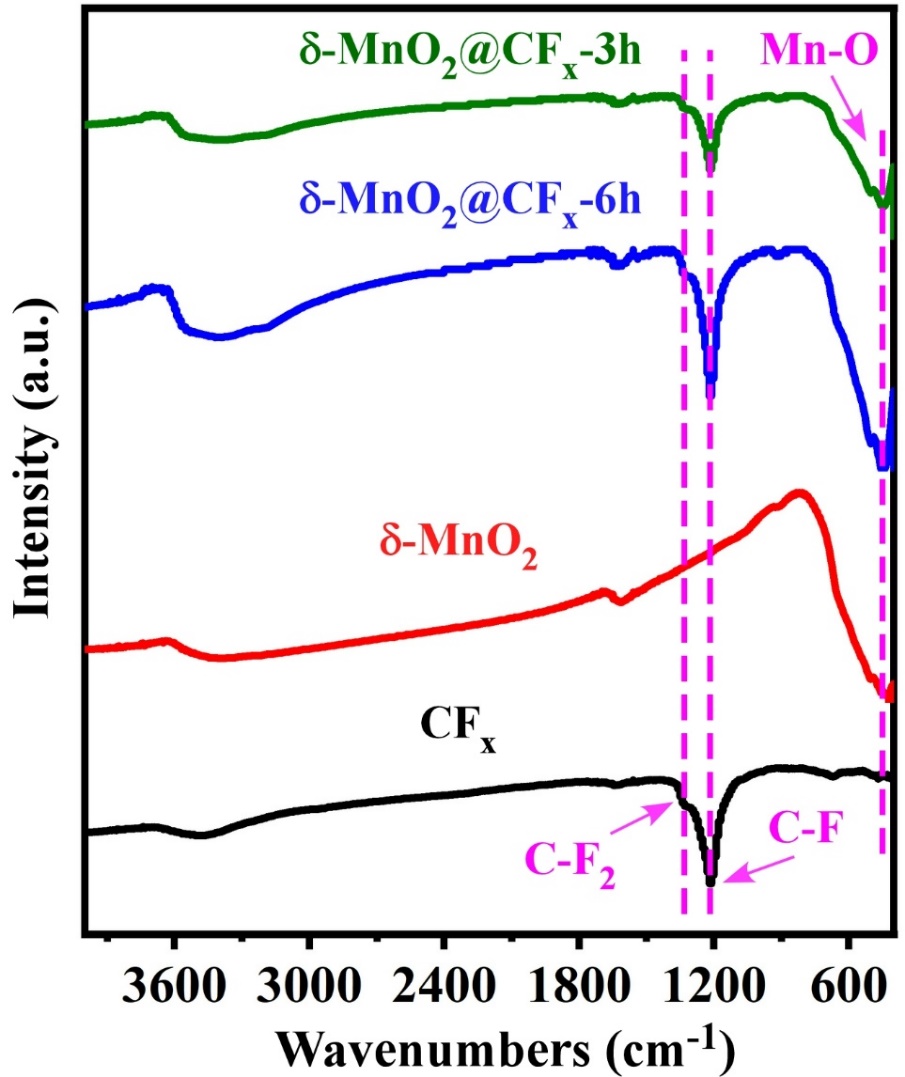
**#** L. Li and R. Wu contributed equally to this work.

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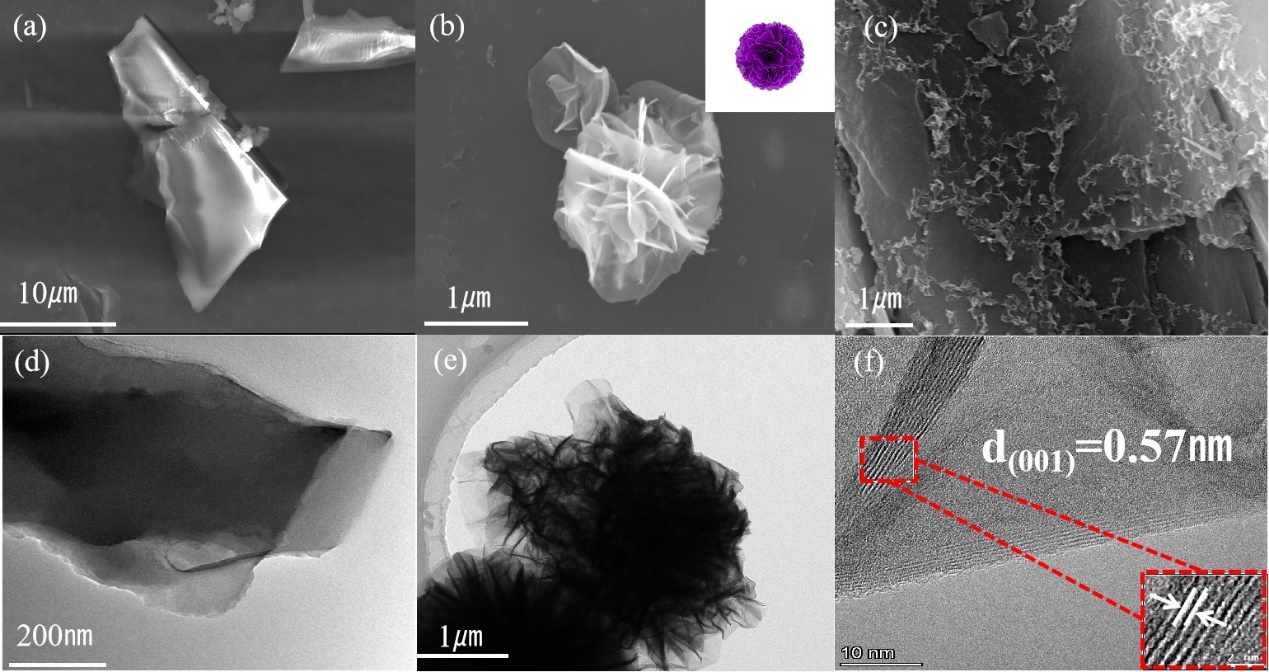
**Keywords:** δ-MnO2; Chemical bonding; Fluorinate carbon; Lithium primary batteries

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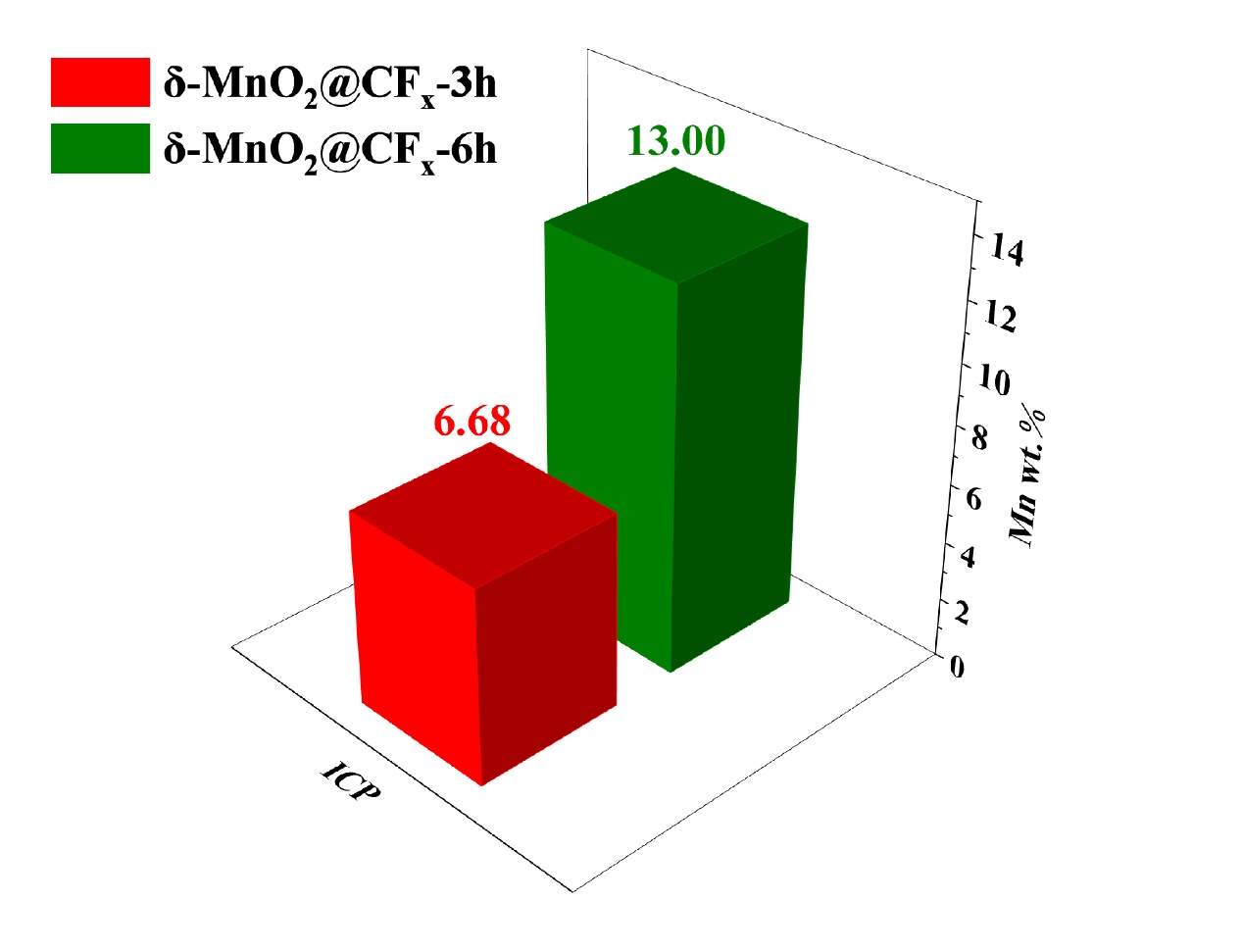
**Figure S1. The full ex situ XRD patterns of CFx, δ-MnO2, δ-MnO2@CFx-6h and δ-MnO2@CFx-3h.**



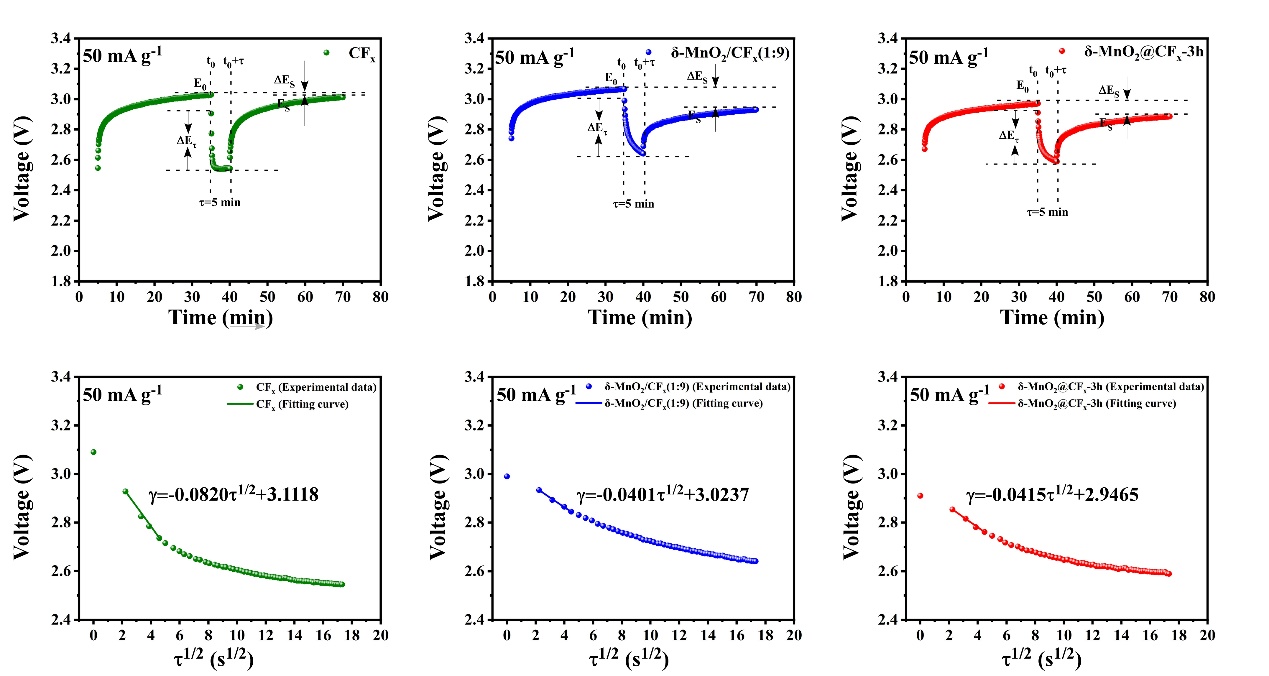
**Figure S2. The full FT-IR patterns of CFx, δ-MnO2, δ-MnO2@CFx-6h and δ-MnO2@CFx-3h.**



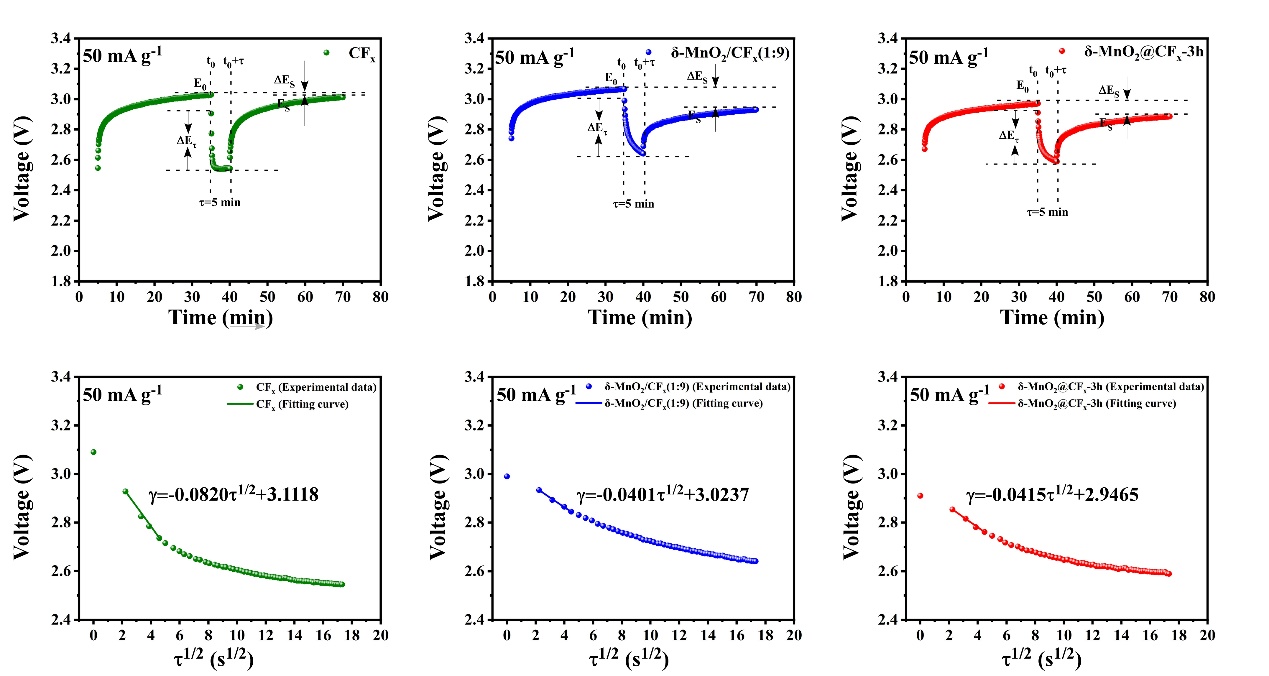
**Figure S3**. **SEM and TEM images of O-CFx, δ-MnO2 and δ-MnO2@CFx**. **(a)** SEM images of O-CFx. **(b)** SEM image of δ-MnO2. Inset: Model diagram of δ-MnO2. **(c)** SEM image of δ-MnO2@CFx. **(d)** TEM images of O-CFx and **(e)** δ-MnO2. HRTEM images of **(f)** δ-MnO2. Inset: Layer spacing of related materials.



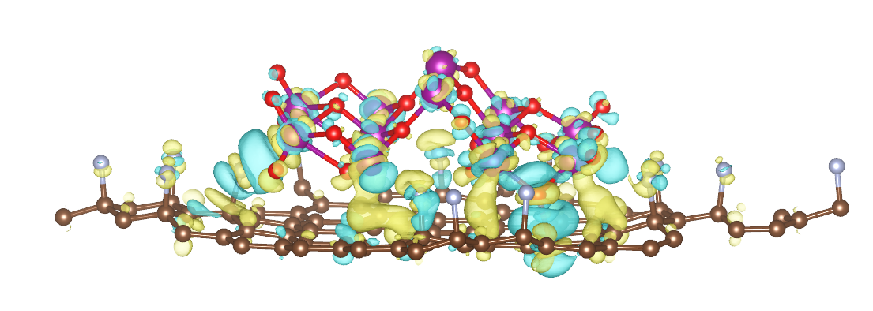
**Figure S4**. **ICP results of δ-MnO2@CFx-3h and δ-MnO2@CFx-6h.**



**Figure S5.** A single step of GITT for **(a)** CFx, **(b)** δ-MnO2/CFx(1:9), **(c)** δ-MnO2@CFx-3h measured at 50 mA g-1.



**Figure S6.** Linear behavior of the transient voltage changes against τ1/2 during a single titration process of CFx, δ-MnO2/CFx(1:9) and δ-MnO2@CFx-3h.



**Figure S7.** Front view of charge density differences of δ-MnO2@CFx.