Supplementary information

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Fig.S1. (a) XRD patterns of Ni0.8Co0.1Mn0.1(OH)2; (b) Rietveld refinement XRD pattern of NCM811

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Fig.S2. Elemental mapping of as-prepared NCM811

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Fig.S3. (a) HRTEM image of NCM811 and (b) FFT image of (a)

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Fig.S4.The discharge profiles of NCM811 at different rates and cut-off voltages.

Tab. S1. Comparison of cycle performance of NCM811 cathode materials

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Preparation method | Voltage range  (Vvs. Li/Li+) | | Discharge capacity at 1C(mAh/g) | Capacity retention at 1C (%) after100 cycles | | Ref. |
| Co-precipitation | 2.7-4.3V | | 171.7 | 95.6 | | This work |
| 2.7-4.5 V | | 187.7 | 86.8 | |
| Solid state | 2.5-4.5V | | 131 | 67.2 | | [1] |
| sol-gel | 2.8-4.3V | | 160 | 90.2 | | [2] |
| Co-precipitation | 2.7-4.3V | | 171.1 | 89.6 | | [3] |
| Co-precipitation | | 3.0-4.3V | 149 | 91.45 | | [4] |
| Co-precipitation | | 2.7-4.3V | 169.7 | | 90.3 | [5] |

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