**Supplementary Materials**



**Figure S1.** CV curves of pure PICFs, CoMnO2@PICF-1, CoMnO2@PICF-3, CoMnO2@PICF-6 and CoMnO2@PICF-9 electrode materials at various scan rates,

**Table S1.** The specific capacitance, energy density and cycle stability of the CoMnO2/N20@PICF-6//Fe2O3/N20@PICF device, compared to previously reported mixed transition metal oxide based electrode materials.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Electorde material** | **Specific capacitance** | **Energy density****(Wh kg-1)** | **Cycle stability** | **Electrolyte** | **Ref.** |
| NiCoMn-TH/AEG//CFP-S | 66 F g-1 at 0.5 A g-1  | 23.5 Wh kg-1 at 427 W kg-1 | 87.8% 10,000 cycles at 6 A g-1 | 1 M KOH | 40 |
| NiCoMn-OH//AC | 121.5 F g-1 at 1 A g-1 | 43.2 Wh kg-1 at 790W kg-1  | 100% 10,000 cycles at 5 A g-1 | PVA/KOH | 41 |
| CoMn-HW/RGO10//AC | 107.6 F g-1 at 1 A g-1 | 38.3 Wh kg-1 at 8000 W kg-1 | 89.5% 3000 cycles at 2 A g-1 | 3M KOH | 42 |
| CoMn LDH/PPy//MLG | 38.6 mAh g-1 at 0.5 A g-1 | 29.6 Wh kg-1 at 500 W kg-1 | 99.5% 8000 cycles  | 2M KOH | 43 |
| NCM//AC | 114.5 mAh g-1 at 3 A g-1 | 23.7 Wh kg-1 at 2625 W kg-1 | 93.2% 10,000 cylces  | 3M KOH | 44 |
| Ni-Mn LDH/rGO//AC | 86.26 F g-1 at 1 A g-1 | 33.8 Wh kg-1 at 850 W kg-1 | 74.1% 10,000 cycles at 10 A g-1 | 2M KOH | 45 |
| Co/Mn-ZIF//AC | 73.54 F g-1 at 0.5 A g-1 | 52.5 Wh kg-1 at 1080 W kg-1 | 51% 1500 cycles at 10 A g-1 | 3M KOH | 46 |
| CoMnO2/N20@PICF-6// Fe2O3/N20@PICF | 221 F g-1 at 0.7 A g-1 | 60.16 Wh kg-1 at 490 W kg-1 | 95% 3000 cylces at 1.4 A g-1 | PVA/KOH | This work |