**Table 1.** Summary of the key components and performance of solid-state zinc-ion batteries

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| --- | --- | --- | --- | --- |
| Cathode/current collector | Anode/current collector | Polymer electrolyte | Energy density | Ref. |
| α-MnO2/CNT paper  1.0-2.5 mg cm-2 MnO2 | \*Zn/CNT paper  3-5 mg cm-2 Zn | ZnSO4/MnSO4 in gelatine-g-PAM/PAN with H2O | 306 mA h g−1MnO2 at 2.8A g-1; 6.18 mWh cm-2 two electrodes | (Li et al., 2018a) |
| β-MnO2/carbon cloth  1.5-2.5 mg cm-2 MnO2 | Zn metal foil | Zn(CF3SO3)2 in PEGDGE with PC | 177 mA h g−1MnO2 at 0.1 A g-1 | (Dong et al., 2020) |
| α-MnO2/CNT/CC  2-3 mg cm-2 MnO2 | \*Zn/Ni-Cu  3-5 mg cm-2 Zn | ZnSO4/MnSO4 in NFM/PAM with H2O | ~ 200 mAh g-1 MnO2 at 4C | (Wang et al., 2018a) |
| γ-MnO2/graphite  1.3-1.5 mg cm-2 MnO2 | Zn foil (5 μm) | Zn(CF3SO3)2 in PEO with BANFs | ~ 146 mAh g-1 MnO2 at 15 mA g-1 | (Wang et al., 2019b) |
| MnO2/CNT Fiber | Zn wire | Zn(CF3SO3)2/MnCl2 in PVA with H2O | 290 mAh g-1 MnO2 at 0.1 A g-1 | (Wang et al., 2018c) |
| MnO2/carbon paper | \*Zn/carbon paper | ZnSO4/MnSO4 in Zn-alginate/PAAM with H2O | 300.4 mA h g−1MnO2 at 0.11 A g-1 | (Xiao et al., 2020) |
| α-MnO2/graphite paper  1-3 mg cm-2 MnO2 | \*Zn/graphite paper | ZnSO4/MnSO4 in PAAM with H2O | 277.5 mA h g−1MnO2 at 1C | (Wang et al., 2018d) |
| MnO2/CNT yarn  2.5-5 mg cm-2 MnO2 | \*Zn/CNT yarn | ZnSO4/MnSO4 in PAAM with H2O | 302.1 mA h g−1MnO2 at 1C | (Li et al., 2018b) |
| MnO2/PEDOT  3.6 mg cm-2 MnO2 | \*Zn/CC  6.14 mg cm-2 Zn | ZnCl2/LiCl/MnSO4 in PVA with H2O | 310 mA h g−1MnO2 at 1.1 A g-1 | (Zeng et al., 2017) |
| MnO2/N-doped CC  3.2 mg cm-2 MnO2 | \*Zn/N doped CC | ZnCl2/LiCl/MnSO4 in PVA with H2O | 350 mA h g−1MnO2 at 0.5 A g-1 | (Qiu et al., 2017) |
| α-MnO2/CNT | \*Zn/CNT  3-5 mg cm-2 Zn | ZnSO4/MnSO4 in EG-waPUA/PAAM with H2O | 275 mA h g−1MnO2 at 0.2 A g-1 | (Mo et al., 2019) |
| V2O5/CNTF | \*Zn/CNTF | ZnCl2 in PVA with H2O | 457.5 mAh cm-3 at 0.3 A cm-3 | (He et al., 2019b) |
| V2O5/stainless steel  4. mg cm-2 V2O5 | Zn/stainless steel | Zn(CF3SO3)2 in gelatin with H2O | 450 mAh g-2 at 0.1 A cm-3 | (Zhao et al., 2019) |
| V5O12·6H2O | Zn foil | Zn(CF3SO3)2 in gelatin with H2O | 300 mAh g-2 at 0.1 A g-1 | (Zhang et al., 2019b) |
| CoHCF/CC  1-3 mg cm-2 CoHCF | \*Zn/CC | Zn(BF4)2 in PVdF-HFP/PEO with EMIM BF4 | 149.5 mAh g-1 CoHCF at 0.2 A g-1 | (Ma et al., 2020a) |
| ZnHCF/CNTF | \*Zn/CNTF | ZnSO4 in CMC with H2O | 100.2 mAh cm-3 ZnHCF  195.39 mWh cm-3 two electrodes | (Zhang et al., 2019c) |
| ZnHCF | \*Zn/CC | Zn(CF3SO3)2 in gelatin-g-PAM with H2O | 38 mAh cm-3 ZnHCF at 25C  120 Wh kg-1 two electrodes | (Chen et al., 2020b) |
| ZOV/graphene foam  4.1 mg cm-2 ZOV | \*Zn/graphene  1.5 mg cm-2 Zn | ZnSO4/Na2SO4 in fumed silica with boric acid/H2O | 204 mAh g-1 ZOV at 0.1 A g-1  140 Wh kg-1 two electrodes | (Chao et al., 2018) |
| PANI/steel mesh | Zn foil coated with SWCNTs | Zn(CF3SO3)2 in PVA with H2O | 123 mAh g-1 PANI at 0.1 A g- | (Huang et al., 2019a) |
| PANI/CNT | \*Zn/CC | ZnSO4 in PAAM with H2O | 144 mAh g-1 PANI at 0.2 A g-1 | (Xiao et al., 2020) |
| PPy/PET | \*Zn/PET | PVA based GPE | 123 mAh g-1 PPy at 1.9 A g-1 | (Wang et al., 2018b) |
| V-MOF/CNTF | Zn/CNTF | ZnCl2 in PVA with H2O | 30.71mWh cm-3 1.46Wcm-3 | (He et al., 2019a) |
| BANFs – branched aramid nanofibers, CC - carbon cloth, CMC - carboxymethyl cellulose sodium, CNTs - carbon nanotubes, CNTF - carbon nanotube fiber, CoHCF - cobalt hexacyanoferrate, EG-waPUA - ethylene glycol-based waterborne anionic polyurethane acrylates, PAAM - polyacrylamide, PANI - polyaniline, PEDOT - poly(3,4-ethylenedioxythiophene), PEGDGE - poly(ethylene glycol)diglycidylether, PPy - polypyrrole, PVA - poly(vinyl alcohol), SWCNTs - single-walled carbon nanotubes, V-MOF – vanadium-based MIL-47 metal-organic frameworks, ZnHCF - zinc hexacyanoferrate, ZOV - zinc orthovanadate  \* Zn anode was prepared by electroplating Zn on 3D substrates. | | | | |