# Electronic Supplementary Information

## Bimetallic Selenide $Cu_4Mo_6Se_8$ Nanosheet Arrays Grown on Carbon Skeleton via MOF-Derived with Enhanced Electrochemical Kinetics for High-Performance Sodium-Ion Batteries

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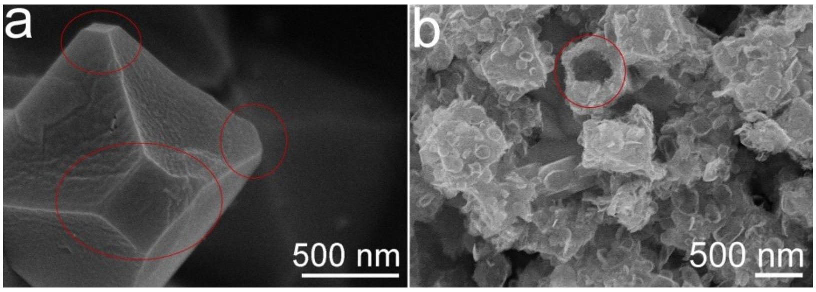


Fig. S1 (a) SEM image of Cu-Mo BMOF. (b) SEM image of CMSe/C composites.

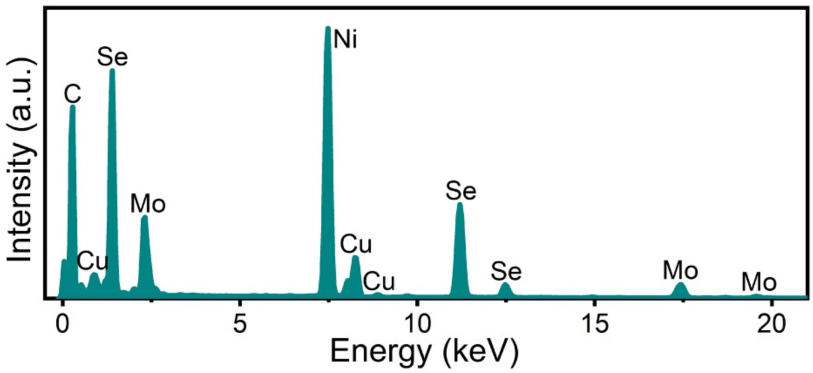


Fig. S2 EDS spectrum of CMSe/C composites.

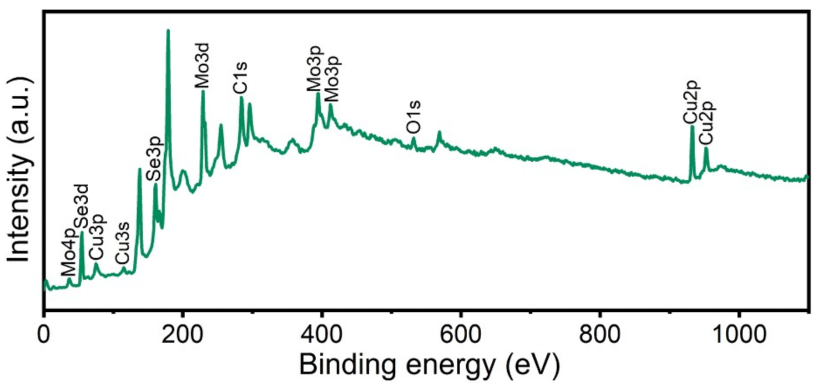


Fig. S3 The XPS survey spectrum of CMSe/C composites.

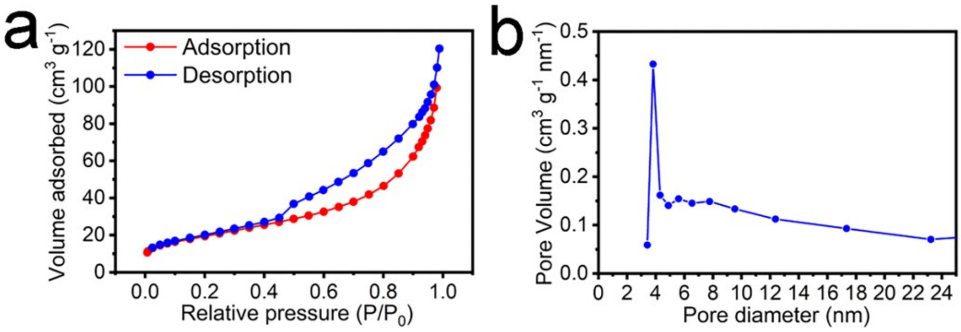


Fig. S4 (a) BET isotherm plots and (b) corresponding BJH pore size distributions of CMSe/C composites.

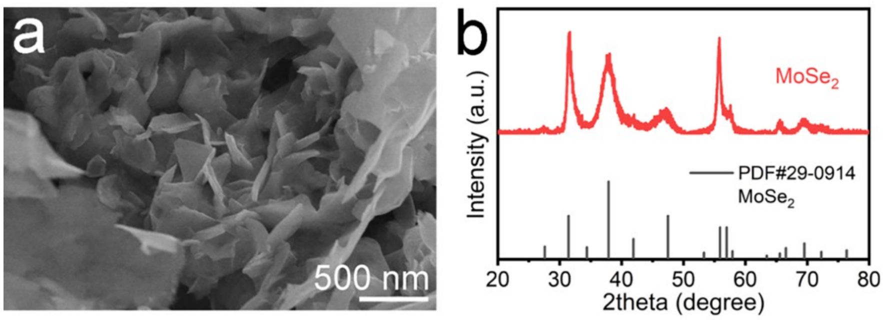


Fig. S5 (a) SEM image of pure $MoSe_2$ nanosheets. (b) XRD pattern of the pure $MoSe_2$.

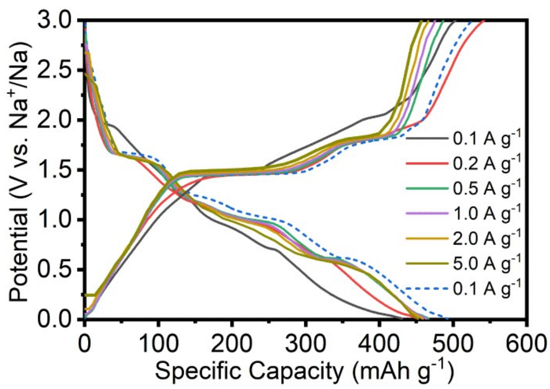


Fig. S6 Galvanostatic charge/discharge curves of CMSe/C electrode at different current densities.

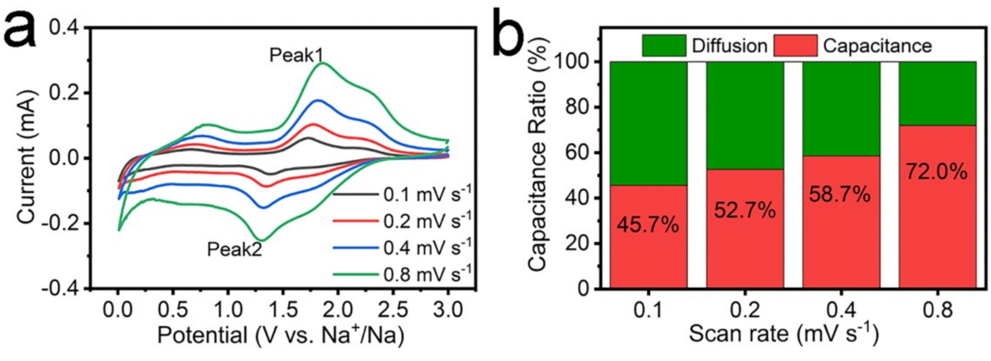


Fig. S7 (a) CV curves and (b) the capacitance contribution ratios of the $MoSe_2$ electrode at various scan rates.

Table S1 ICE of various metal selenide composites applied as anode for SIBs reported in the previous literature.

| Materials | ICE | Current Density | Ref. |
|---|---|---|---|
| **$SnSe_2$/ZnSe@PDA** | 71.6 % | 0.1 A $g^{-1}$ | 1 |
| **$CoSe_2$@BCN-750** | 68.5 % | 0.1 A $g^{-1}$ | 2 |
| **$CoSe_2$@C NC** | 71.4 % | 0.1 A $g^{-1}$ | 3 |
| **CNT/$FeSe_2$/C** | 71.5 % | 0.1 A $g^{-1}$ | 4 |
| **$CoSe_2$@NC-NR/CNT** | 65.8 % | 0.1 A $g^{-1}$ | 5 |
| **$Ni_{1.8}Co_{1.2}Se_4$@NDDC** | 68.0 % | 0.1 A $g^{-1}$ | 6 |
| **$MoSe_2$/N-PCD** | 70.4 % | 0.2 A $g^{-1}$ | 7 |
| **$NiCo_2Se_4$/f-$Ti_3C_2$** | 77.8 % | 0.5 A $g^{-1}$ | 8 |
| **$CoSe_2$/(NiCo)$Se_2$** | 79.6 % | 0.2 A $g^{-1}$ | 9 |
| **FeCo-Se@NC** | 68.7 % | 0.5 A $g^{-1}$ | 10 |
| **a-SnSe/rGO** | 70.0 % | 0.1 A $g^{-1}$ | 11 |
| **$Co_{0.85}$Se-$Fe_7Se_8$@rGO** | 79.4 % | 0.1 A $g^{-1}$ | 12 |
| **ZnSe@C@rGO** | 68.1 % | 0.1 A $g^{-1}$ | 13 |
| **$SnSe_2$/$FeSe_2$@NC** | 72.5 % | 0.2 A $g^{-1}$ | 14 |
| **$Cu_4Mo_6Se_8$/C** | 80.5 % | 0.5 A $g^{-1}$ | This Work |

Table S2 The cycle performance of Mo-based or Cu-based selenide electrodes in SIBs.

| Materials | Cycle Performance | Current Density | Ref. |
|---|---|---|---|
| **$Cu_2Se$** | 256 mAh $g^{-1}$ after 1000 cycles | 1.0 A $g^{-1}$ | 15 |
| **$MoSe_2$/CN** | 328.7 mAh $g^{-1}$ after 500 cycles | 1.0 A $g^{-1}$ | 16 |

| | | | |
|---|---|---|---|
| **$Cu_2Se$** | 308 mAh $g^{-1}$ after 50th cycles | 0.1 A $g^{-1}$ | 17 |
| **P-$MoSe_2$/N-CNT NF** | 372 mAh $g^{-1}$ after 300 cycles | 0.2 A $g^{-1}$ | 18 |
| **$MoSe_2$/N-PCD** | 223 mAh $g^{-1}$ after 1000 cycles | 2.0 A $g^{-1}$ | 7 |
| **$MoS_2$/N,P-rGO** | 236.6 mAh $g^{-1}$ after 7000 cycles | 2.0 A $g^{-1}$ | 19 |
| **$MoSe_2$@NPC/rGO** | 340 mAh $g^{-1}$ after 500 cycles | 0.5 A $g^{-1}$ | 20 |
| **$Cu_4Mo_6Se_8$/C** | 474 mAh $g^{-1}$ after 2400 cycles | 2.0 A $g^{-1}$ | This Work |

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