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Supporting Information

# Molybdenum Sulfide Nanosheet-Based Hollow Porous Flat Boxes and Nanotubes for Efficient Electrochemical Hydrogen Evolution

Liao Chen and Hongli Zhu*[a]

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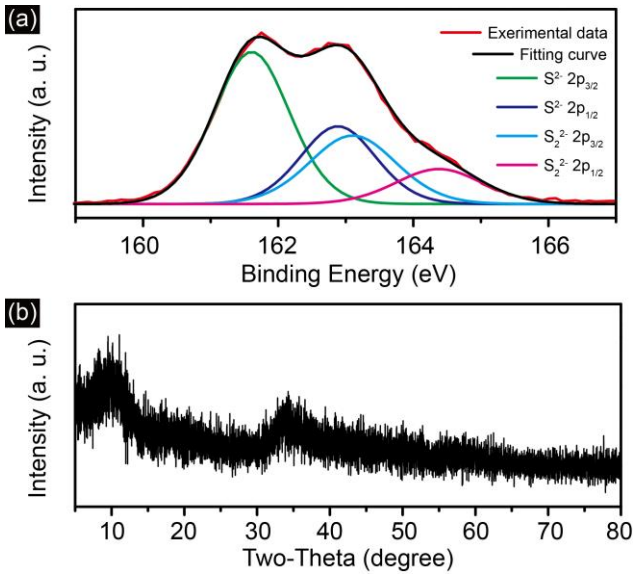


**Fig. S1** Composition and crystallinity information of MoSx nanosheet-based hollow porous nanotubes: (a) Deconvolution of the high resolution scan in S 2p region confirms the existence of S22- units in the hollow porous MoSx nanotubes; (b) XRD pattern indicates the as-prepared hollow porous MoSx nanotubes are poorly crystalline. Molybdenum sulfide nanosheet-based hollow porous nanotubes with the $S_2^{2-}$ units and low crystallinity are successfully synthesized.

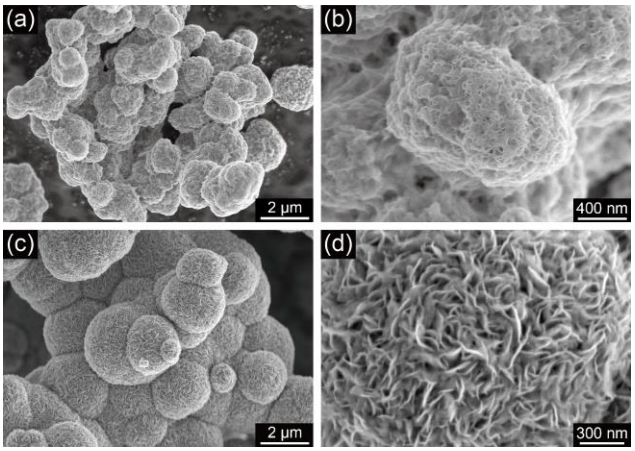


**Fig. S2** The non-dispersive particles prepared with low ethanol concentration in the mixed solvent for the solvothermal reaction: (a, b) SEM images of particles prepared with a water/ethanol mixed solvent of 40 v/v% ethanol; (c, d) SEM images of particles prepared with a water/ ethanol mixed solvent of 20 v/v% ethanol.


**Fig. S3** The dispersion properties of the as-prepared products in water: products (nansheets and nanosheet-based hollow porous nanotubes and flat boxes) prepared with 60 v/v% ethanol or over 60 v/v% ethanol in the reaction solvent are highly dispersive and the corresponding suspensions are still super stable even after 12 hours.

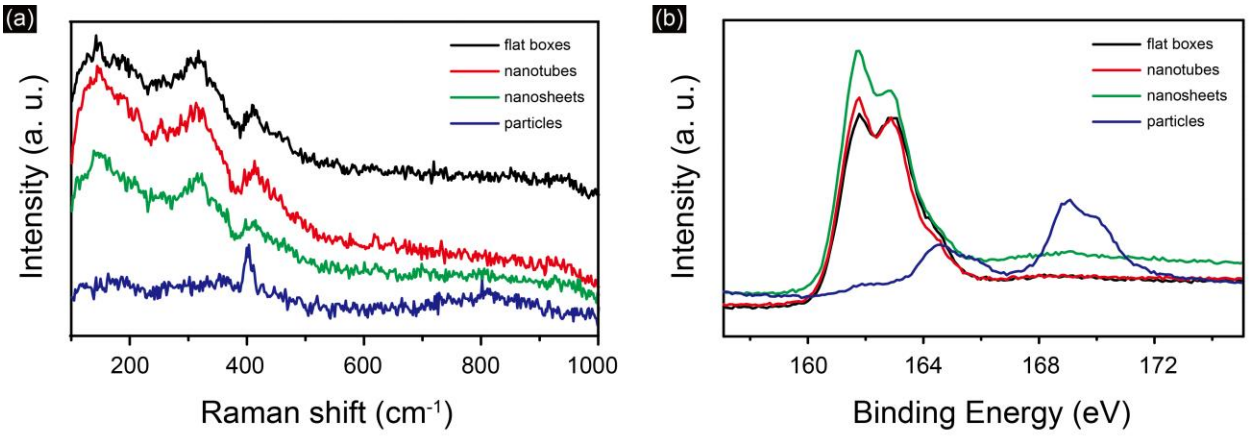


**Fig. S4** The significant differences between the highly dispersive products (nansheets and nanosheet-based hollow porous nanotubes and flat boxes) and the non-dispersive particles prepared with reaction solvents of low ethanol concentrations. (a) Raman spectrums (b) XPS high resolution scans in S 2p regions.

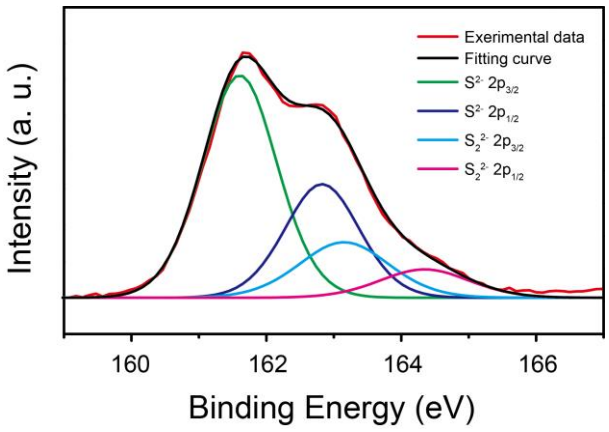


**Fig. S5** Deconvolution of the high resolution scan in S 2p region of the highly dispersive nanosheets product synthesized with 60 v/v% ethanol and 40 v/v% DI water as the reaction solvent.

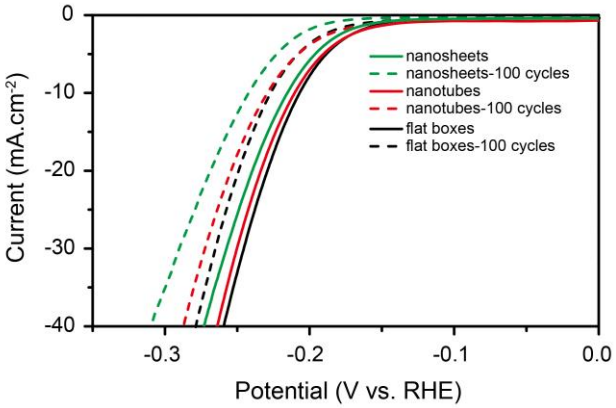


**Fig. S6** Stability of the as-prepared $MoS_x$ nanosheet-based hollow porous flat boxes, nanosheet-based hollow porous nanotubes, and nanosheets. After 100 cycles, the overpotential of $MoS_x$ flat boxes, nanotubes, and nanosheets to obtain 10 $mAcm^{-2}$ current increase by 21 mV, 19 mV and 26 mV respectively.