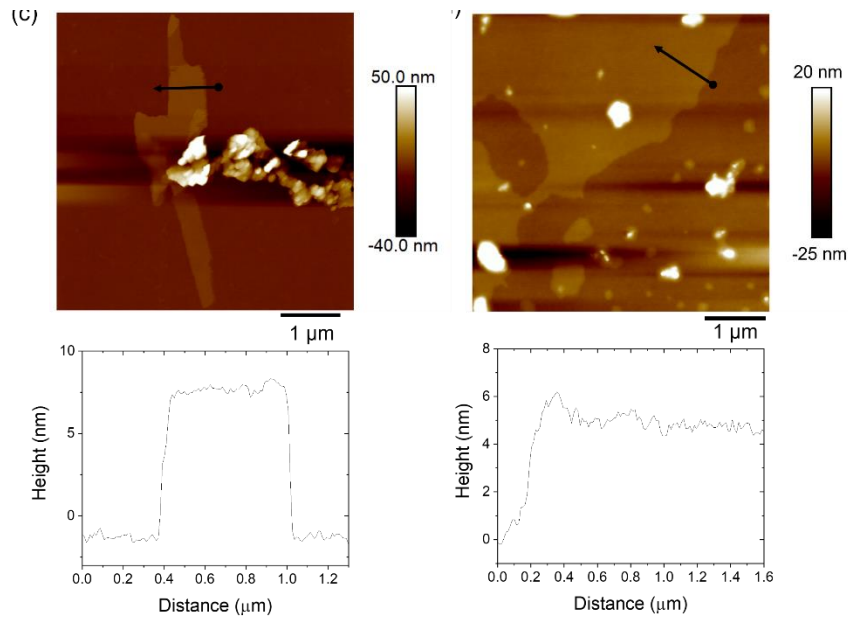


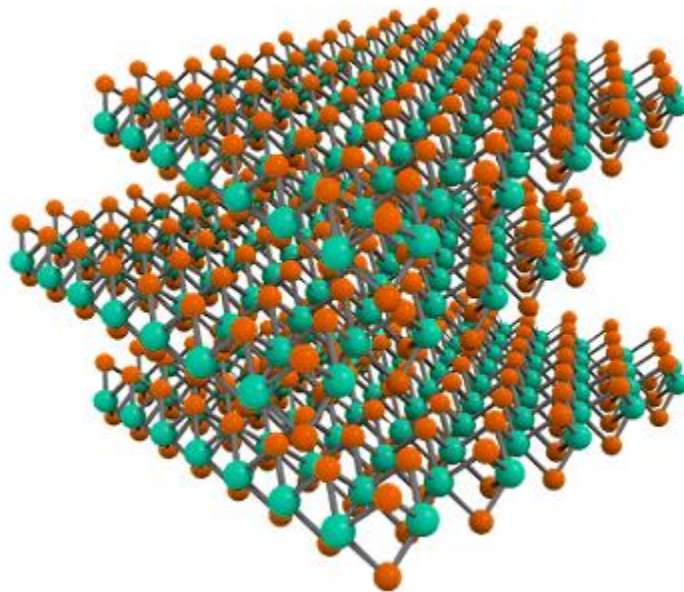
Supercapacitor

MoS₂

1. Chemically **exfoliated**-MoS₂ (eMoS₂) solution
 - A. Add 15 mg of MoS₂ powder and add it to 30 mL DMF (or NMP) in a tube.
 - B. Block the top of it with the paraffin film.
 - C. Tip sonication (50 % power) for 1 h.



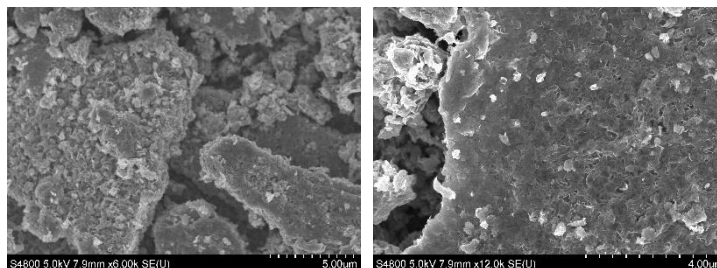
Plates in the images => exfoliated MoS₂.



2. Solvothermal-synthesized **defect-free** MoS₂ (pMoS₂)
 - A. Add ~1 mmol (**~36 mg**) hexaammonium heptamolybdate tetrahydrate ((NH₄)₆Mo₇O₂₄·4H₂O, HHT, i.e. 7 mmol Mo) and ~14 mmol (**~58 mg**) thiourea

in ~40 mL deionized water.

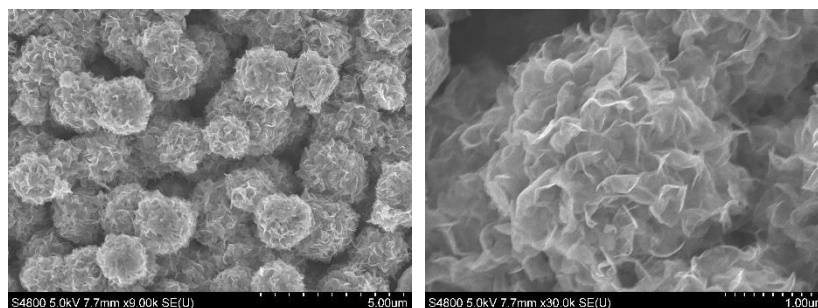
- B. Stirring for 15 min (use magnetic stirring device).
- C. Transfer the solution to Teflon-lined stainless steel autoclave (fasten everything tightly).
- D. Incubating the solution at 220 C (overnight).



Thick MoS₂ plates, yield = ~30 % of Mo source.

3. Solvothermal-synthesized **defect-rich** MoS₂ (nMoS₂)

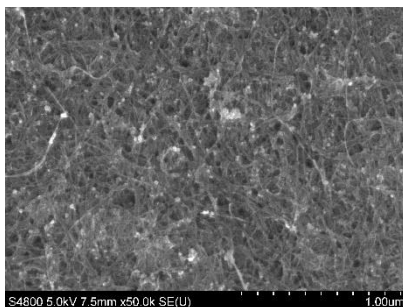
- A. Add ~0.9 mmol (**~30 mg**) hexaammonium heptamolybdate tetrahydrate ((NH₄)₆Mo₇O₂₄·4H₂O, HHT, i.e. 7 mmol Mo) and ~27 mmol (**~100 mg**) thiourea in ~40 mL deionized water.
- B. Stirring for 15 min (use magnetic stirring device).
- C. Transfer the solution to Teflon-lined stainless steel autoclave (fasten everything tightly).
- D. Incubating the solution at 220 C (overnight).



Carbon nanotube (CNT)-ZIF (Zeolitic imidazole framework)-MoS₂

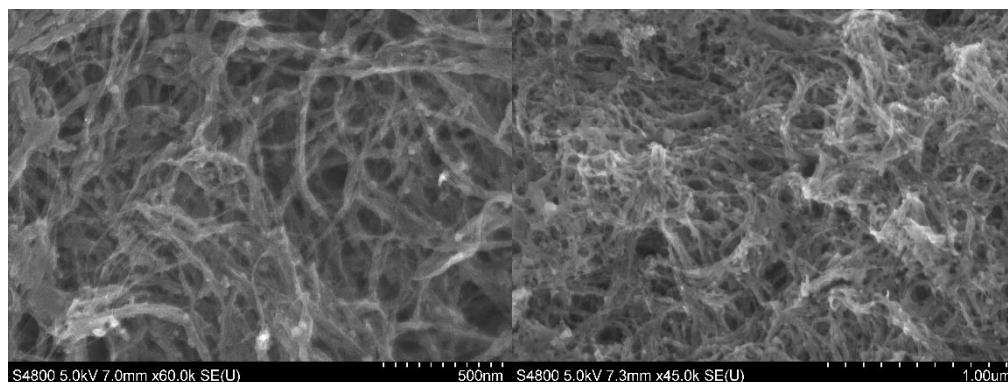
1. CNT

- A. Add 5 mg of CNT powder in 30 mL DMF in a tube.
 - B. Add 30 mg of dopamine hydrochloride in the solution.
 - C. Block the top of it with the paraffin film.
 - D. Tip sonication (50 % power) for 30 min.
 - E. Stirring for 2 h (use magnetic stirring device).
- Dopamine will be coated on CNT. Dopamine layer will act as a precursor for the growth of ZIF.



2. CNT-ZIF

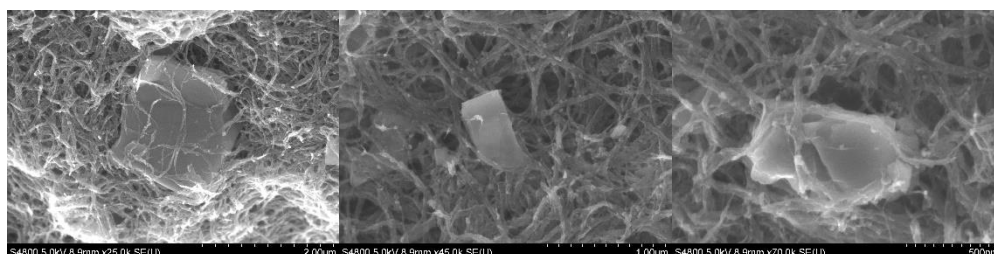
- A. Add 30 mg of zinc chloride and 15 mg of 1h-1,2,4-triazole-3-thiol in the CNT solution
- B. Block the top of it with the paraffin film.
- C. Tip sonication (50 % power) for 10 min.
- D. Incubating the solution for over 44 h at 120 C.



3. CNT-ZIF-MoS2

A. CNT-ZIF-eMoS2

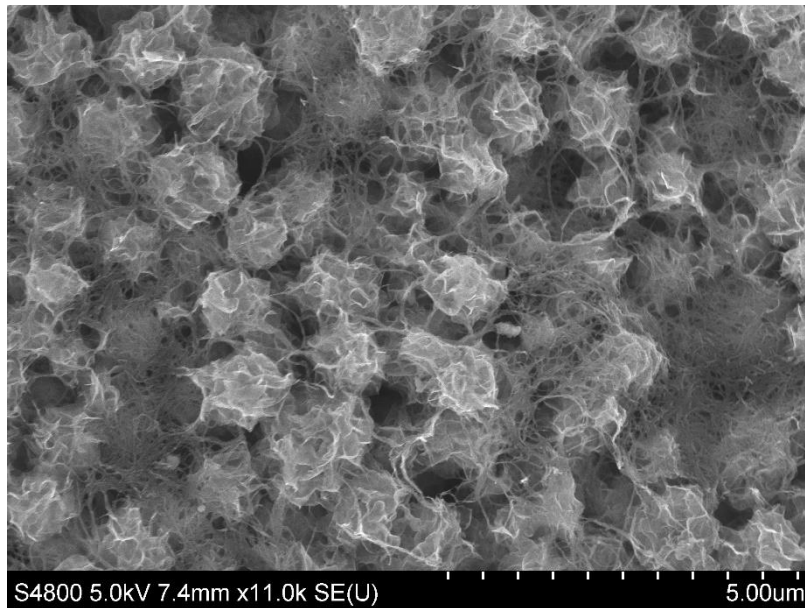
- Add 10 mg of MoS2 in the CNT-ZIF solution
- Tip sonication (50 % power) for 30 min.
- Incubating the solution at 80 C (overnight).



B. CNT-ZIF-nMoS2

- Vacuum-filtrate the CNT-ZIF solution. CNT-ZIF will form a dark film.
- Wash the film with excess amount of EtOH.
- Bake the film at 110 C (overnight).

- Grind the film with glass stick and get CNT-ZIF powder.
- Mix the powder with 0.9 mmol (~30 mg) hexaammonium heptamolybdate tetrahydrate ((NH₄)₆Mo₇O₂₄·4H₂O, HHT, i.e. 7 mmol Mo) and 27 mmol (~100 mg) thiourea in ~40 mL deionized water.
- Tip sonication (50 % power) for 30 min.
- Transfer the solution to Teflon-lined stainless steel autoclave (fasten everything tightly).
- Incubating the solution for 24 h at 220 C.

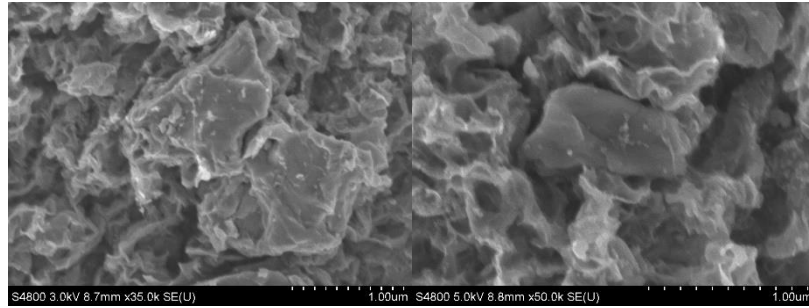


MoS₂ nanoflowers are woven with CNT-ZIF network.

yield = 30~40 % of Mo source.

C. CNT-ZIF-pMoS₂

- Vacuum-filtrate the CNT-ZIF solution. CNT-ZIF will form a dark film.
- Wash the film with excess amount of EtOH.
- Bake the film at 110 C (overnight).
- Grind the film with glass stick and get CNT-ZIF powder.
- Mix the powder with ~1 mmol (~36 mg) hexaammonium heptamolybdate tetrahydrate ((NH₄)₆Mo₇O₂₄·4H₂O, HHT, i.e. 7 mmol Mo) and ~14 mmol (~58 mg) thiourea in ~40 mL deionized water.
- Tip sonication (50 % power) for 30 min.
- Transfer the solution to Teflon-lined stainless steel autoclave (fasten everything tightly).
- Incubating the solution for 24 h at 220 C.



CNT-ZIF fibers are completely packed with MoS₂ plates.

MoS₂ nanoplate, yield = 30~40 % of Mo source.