# Supplementary Information

# MoS$_2$-Cysteine nanofiltration membrane for lead removal

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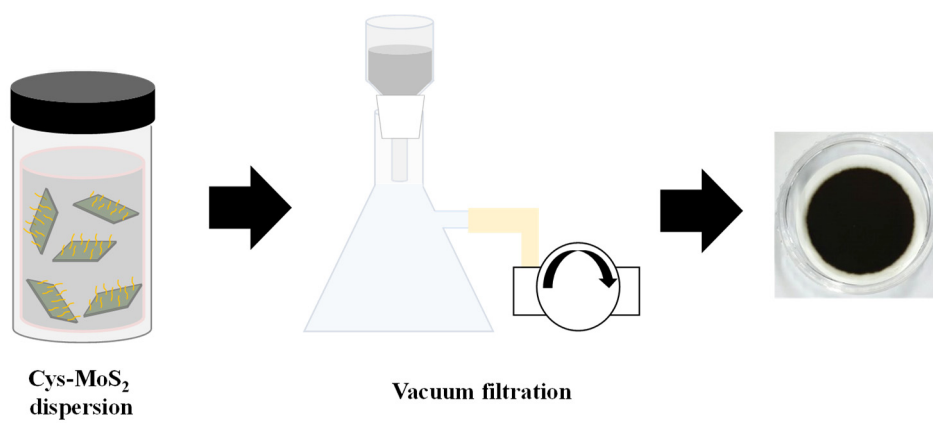
**Cys-MoS$_2$ dispersion**

**Vacuum filtration**

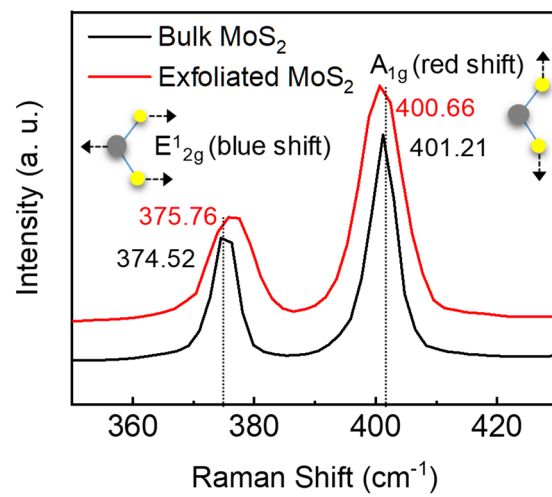**Figure S1**. A fabrication process of Cys-MoS$_2$ NF membranes.

**Figure S2**. Raman spectra of the bulk MoS₂ and exfoliated MoS₂ nanosheet.
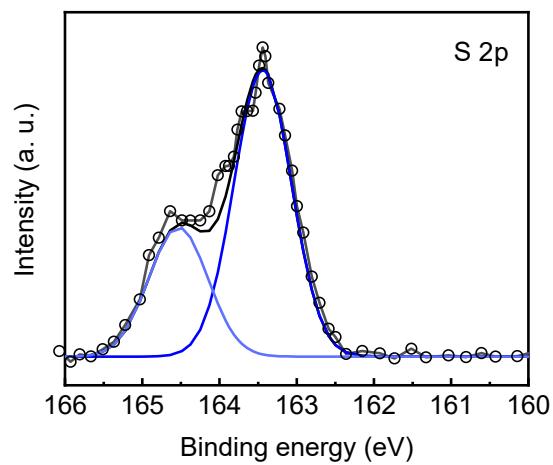
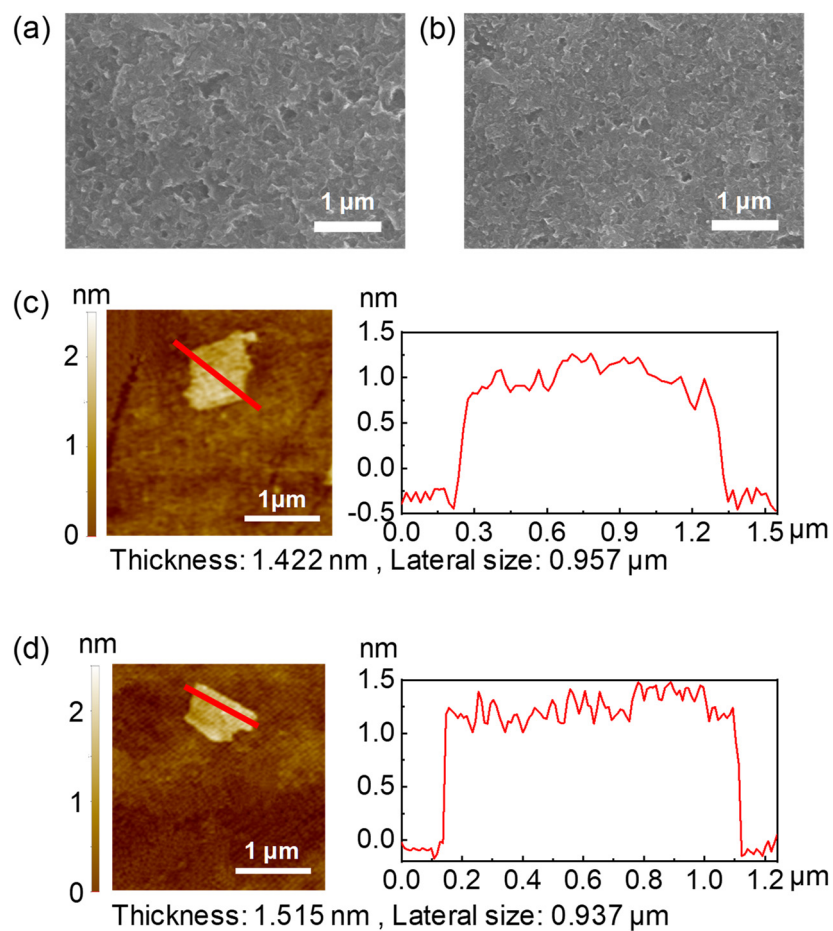**Figure S3**. S 2p XPS core-level spectra of the Cysteine.

**Figure S4**. SEM images of (a) pristine $MoS_2$ and (b) $MoS_2$-Cys membranes. AFM results of (c) pristine $MoS_2$ and (d) $MoS_2$-Cys membranes.
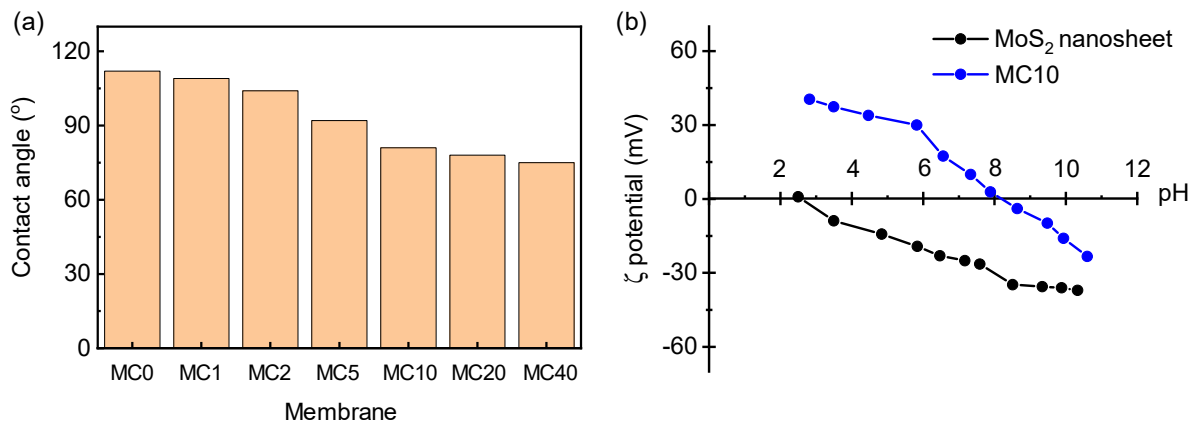
**Figure S5**. (a) Water contact angle according to Cysteine concentration and (b) Zeta potential of the MoS₂ nanosheet and MC10 in various pH.
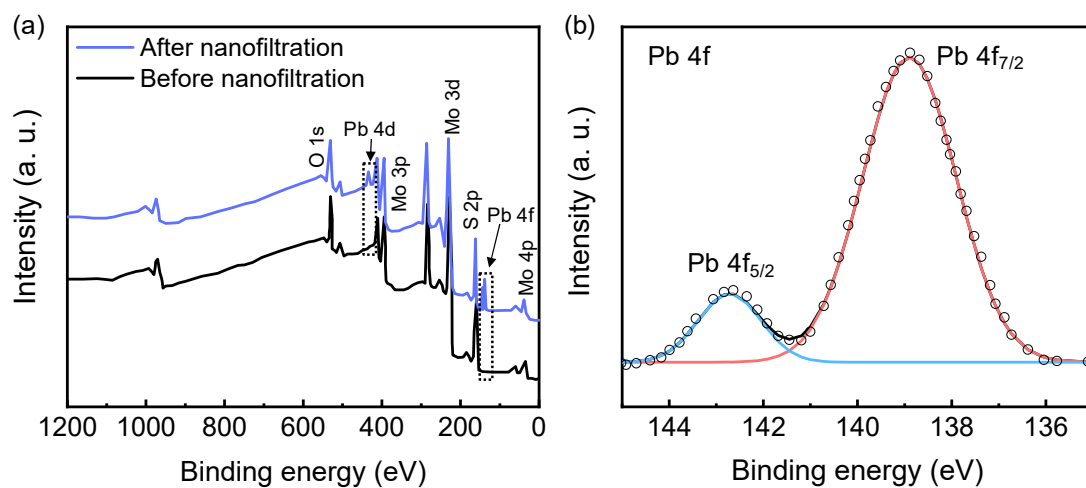
**Figure S6**. (a) XPS survey spectra before/after nanofiltration and (b) Pb 4f core-level after nanofiltration of the MoS$_2$-Cys membrane.