Electronic Supplementary Material (ESI) for Nanoscale.

Large−area synthesis of monolayer $MoS_{2(1-x)}Se_{2x}$ with a tunable band gap and its enhanced electrochemical catalytic activity

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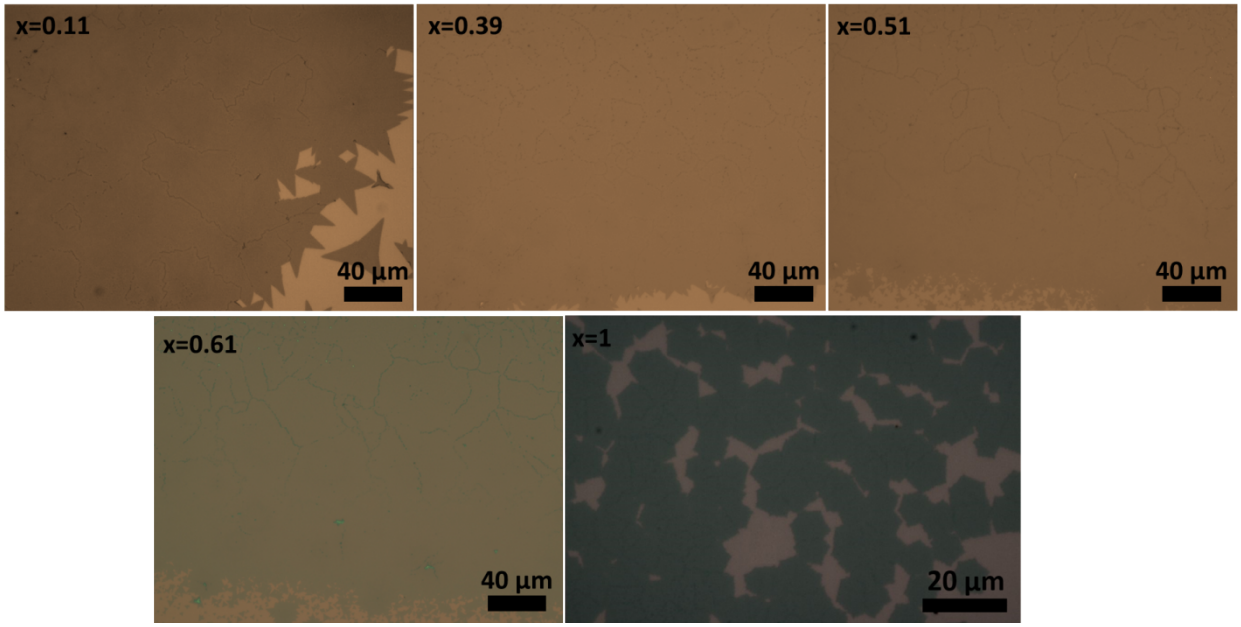

Fig. S1 Optical images of monolayer $MoS_{2(1-x)}Se_{2x}$ with different S composition.

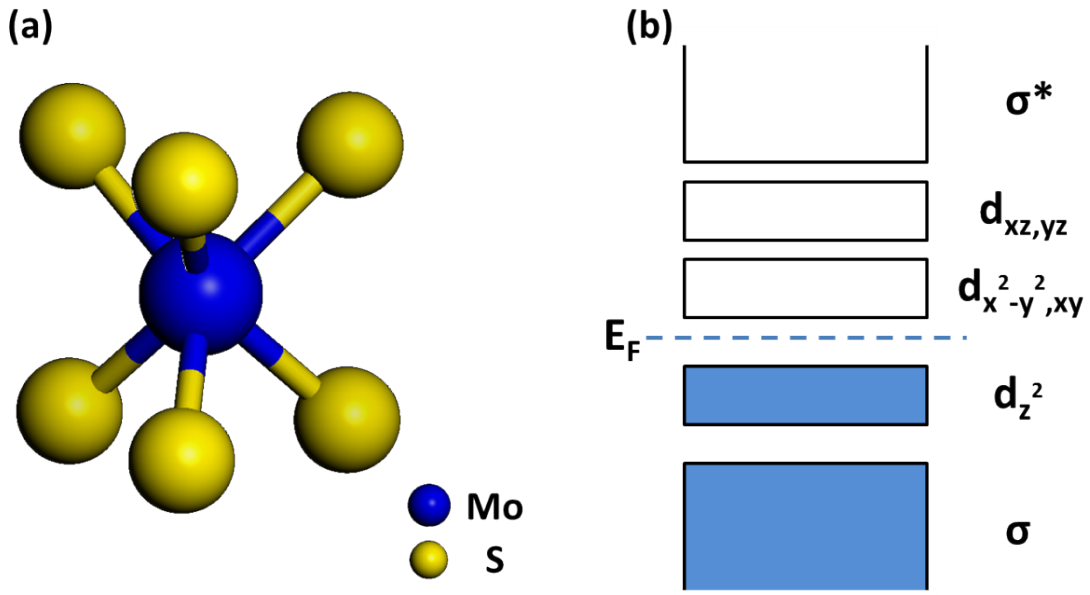

Fig. S2 (a) Schematic structure of monolayer MoS_2. The Mo atoms are bonded with six S atoms symmetrically. (b) Schematic illustration of the band structure of 1H MoX_2 (X=S, Se, Te). The non-bonding *d* bands are located within the gap of bonding (σ) and antibonding (σ *) bands. From bottom to top, the non-bonding *d* bands are Mo-d_{z^2}, Mo-$d_{x^2-y^2,\ xy}$ and Mo-$d_{xz,\ yz}$ orbitals, respectively. The filled states are shaded with blue. The gap between the Mo-d_{z^2} and Mo-$d_{x^2-y^2,xy}$ orbitals are corresponding to the band gap of 1H MoX_2.[S1]

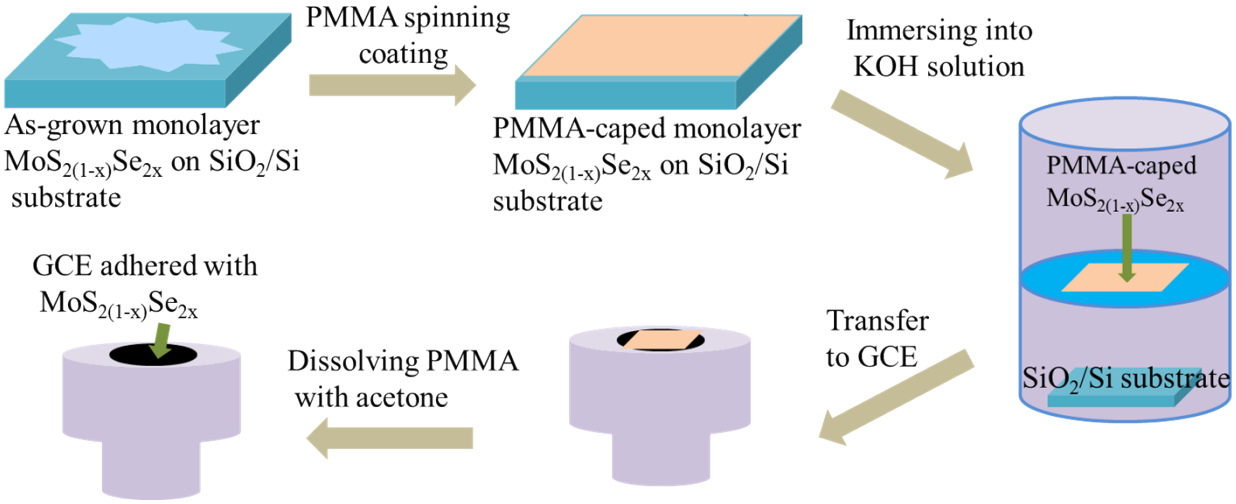

Fig. S3 Schematic illustration of transferring the as-grown monolayer $MoS_{2(1-x)}Se_{2x}$ onto GCE.

References

S1 M. Chhowalla, H. S. Shin, G. Eda, L.-J. Li, K. P. Loh and H. Zhang, *Nat. Chem.*, 2013, **5**, 263–275.