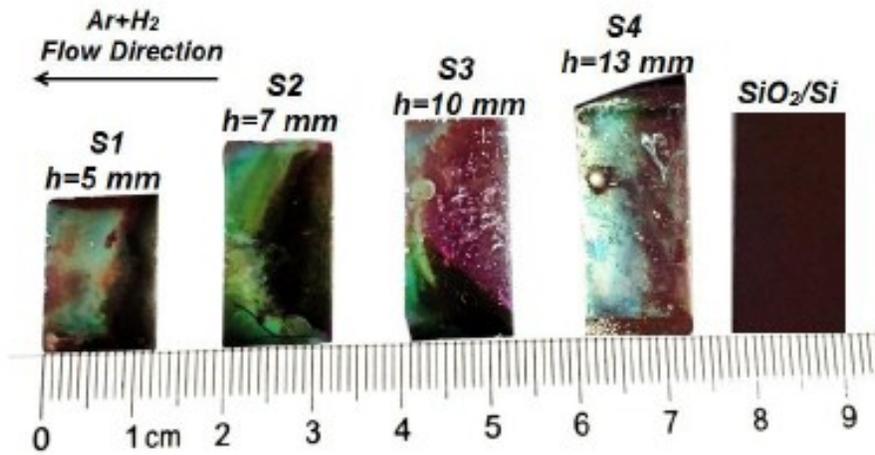


Supporting Information

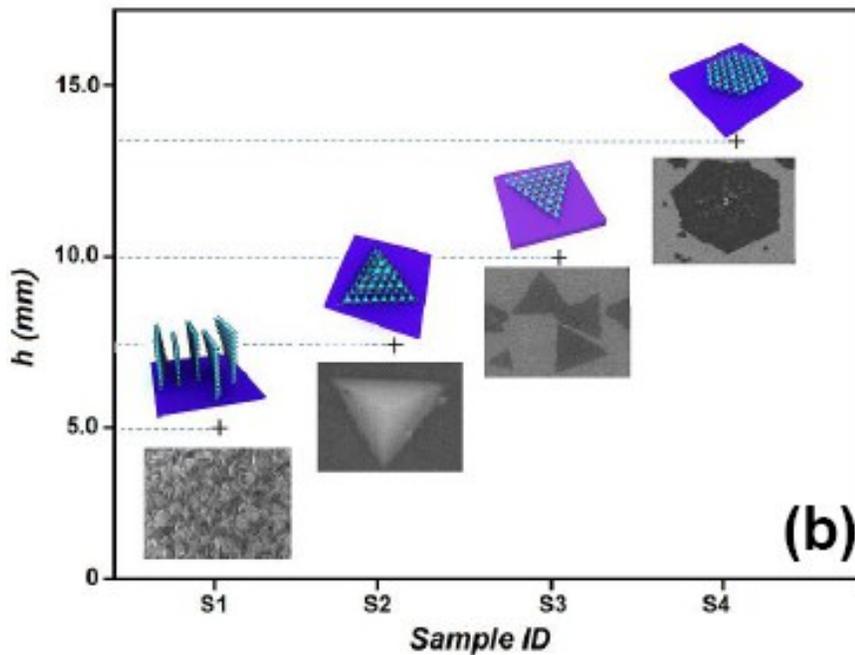
CVD Growth of Molybdenum Diselenide Surface Structures with Tailored Morphology

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Substrate Used for the growth of MoSe₂



(a)



(b)

Figure S1: (a) Optical camera photograph of as grown MoSe₂ on SiO₂/Si substrates showing the large-scale growth and also illustrate the geometry of the substrates. S1,S2, S3 and S4 samples grown at a height of 5, 7, 10 and 13 mm from source MoO₃ respectively (b) Schematic illustration of the surface structure transformation in morphology of MoSe₂ grown at different values of "h". SEM micrographs represent the different morphology at different value of "h".

Figure S1 shows the substrate used for the growth, different size of the samples substrate immediately reflects in the visual observations. The width of the substrate for all the samples is same. A gradient color change is observed (Figure. S1a), the right side of the substrate that is darker was near to the MoO_3 precursor. The width of the dark area increases with vertical distance between the substrate and precursor and has maximum spread at the height of 10 mm. This confirms that the growth happened on the substrate at first look if compare to the SiO_2/Si substrate.

Optical Microscope Imaging of MoSe₂

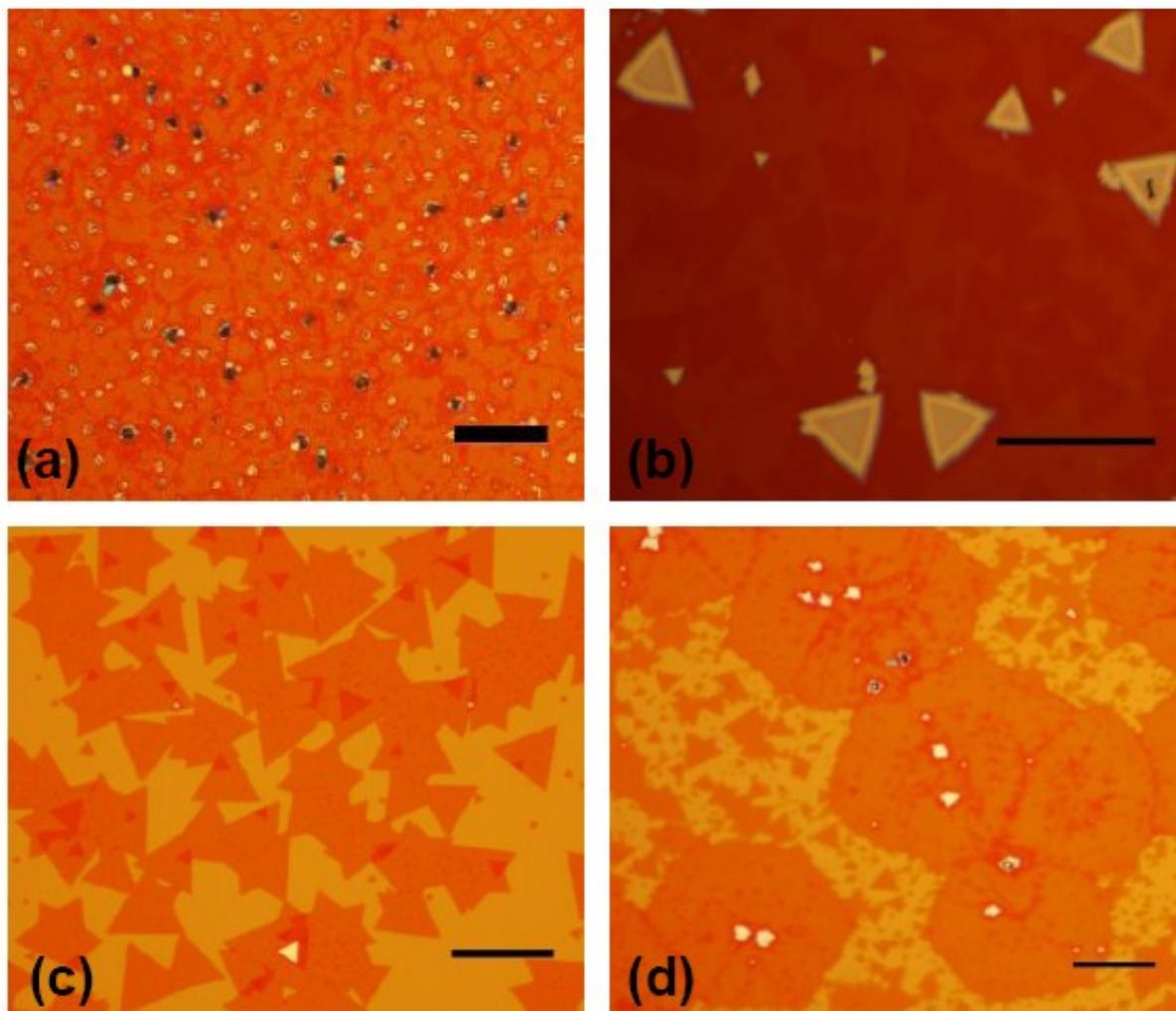


Figure S2: Optical microscope images of MoSe₂ as grown samples, Scale bar: 20 μm (a) S1, the morphology is not clear from this image (b) S2, the pyramid like morphology (c) S3, the triangular morphology of the MoSe₂ flakes and (d) S4, MoSe₂ flakes with hexagonal morphology.

Optical microscopy images in Figure S2 show the variation in morphology of the grown MoSe₂ samples at the different distance. The morphology of the sample S1 cannot be clearly distinguished by the optical microscopy while S2-S4 samples clearly shows the variation in the morphology at different distances h , which changes from pyramidal, triangular and hexagonal.

XPS survey spectra of MoSe₂

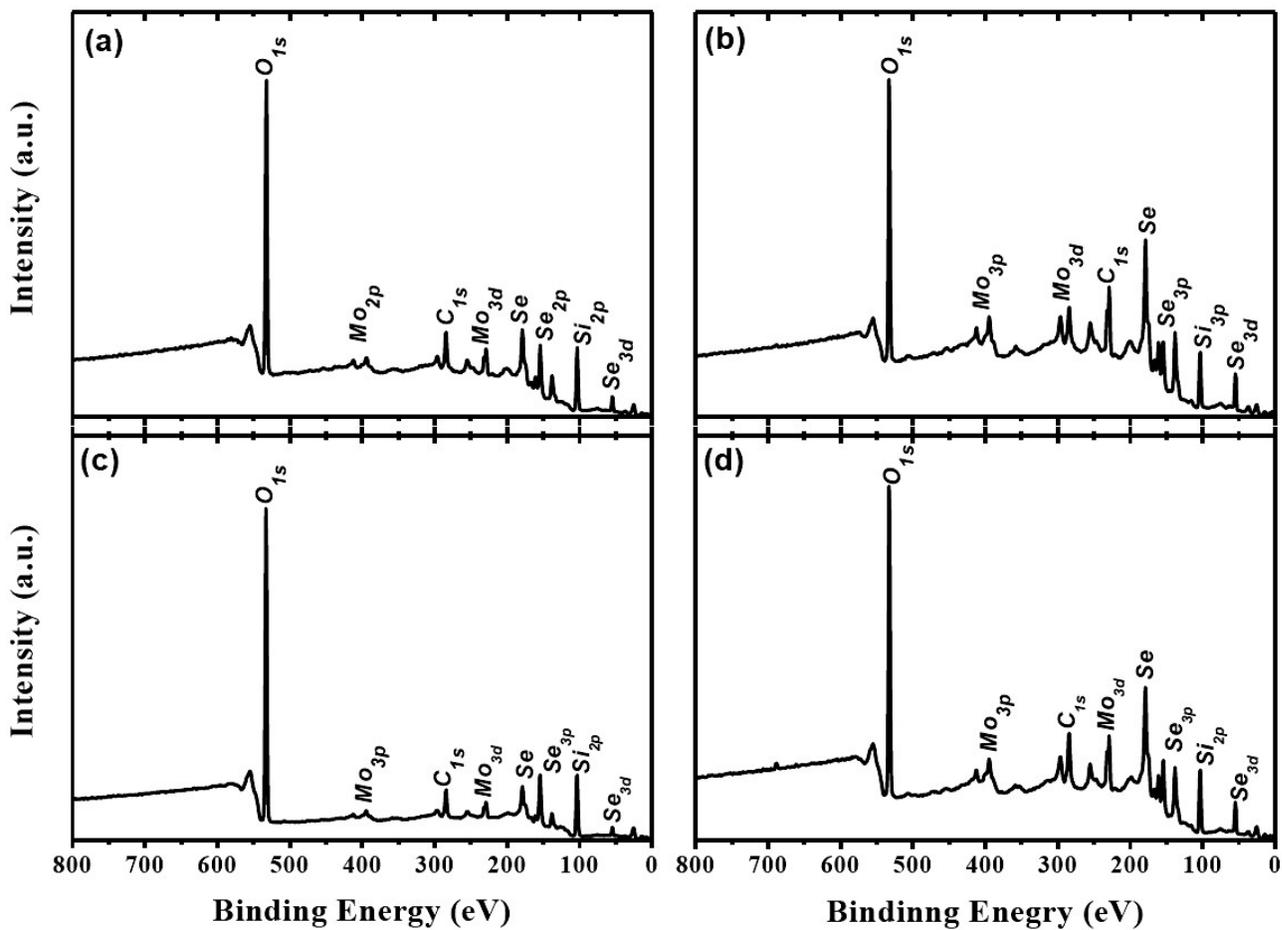


Figure S3: XPS spectra of MoSe₂ samples grown by CVD (a) S1, (b) S2, (c) S3 and (d) S4. The characteristic peaks detected are labelled.

XRD of MoSe₂

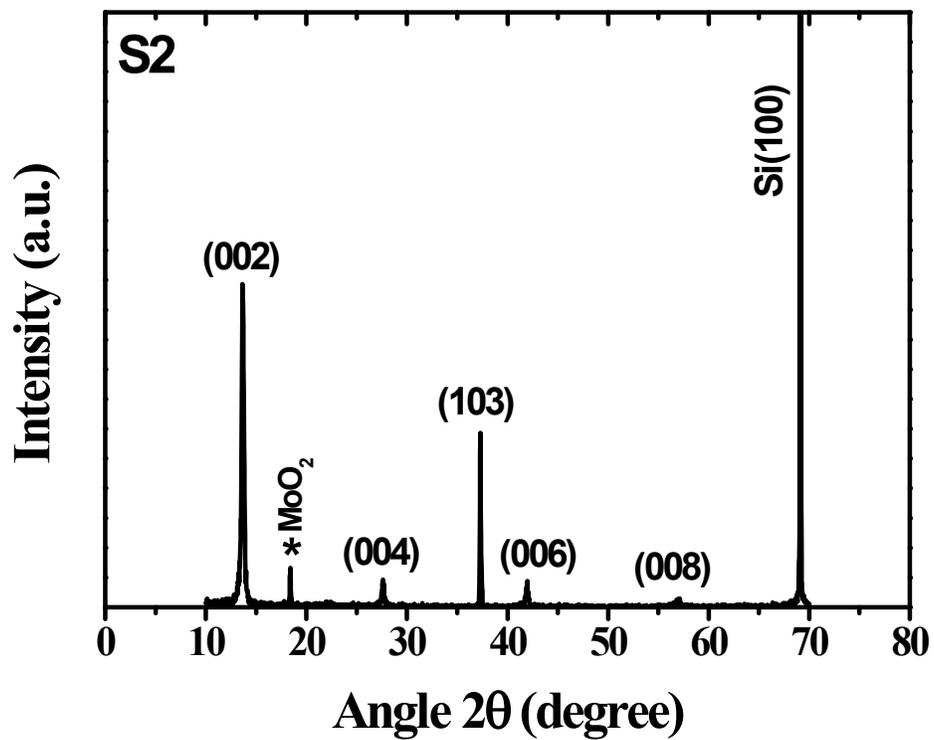


Figure S4: XRD pattern of MoSe₂ samples S2 grown by CVD. All the peaks are indexed, The substrate peaks Si(100) is clear in pattern.