

Selective Chemical Vapor Deposition Growth of WS₂/MoS₂ Vertical and Lateral Heterostructures on Gold Foils

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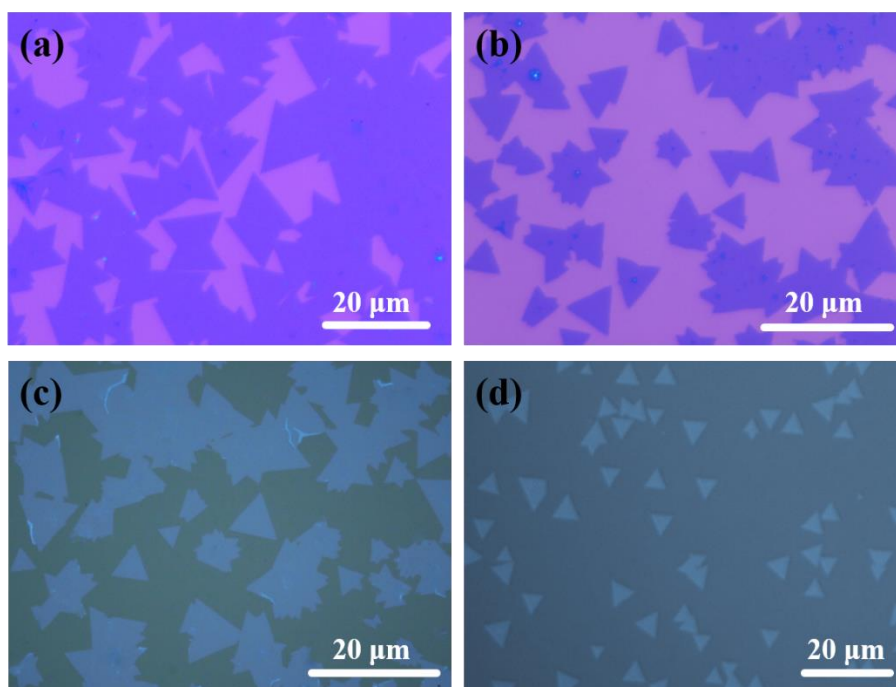


Figure S1. Typical optical microscopic images of monolayer MoS₂ and WS₂ domains grown on different substrates. (a) MoS₂ grown on SiO₂/Si at 750 °C for 20 min. (b) WS₂ grown on SiO₂/Si at 850 °C for 15 min. (c) MoS₂ grown on c-sapphire at 750 °C for 20 min. (d) WS₂ grown on c-sapphire at 850 °C for 15 min.

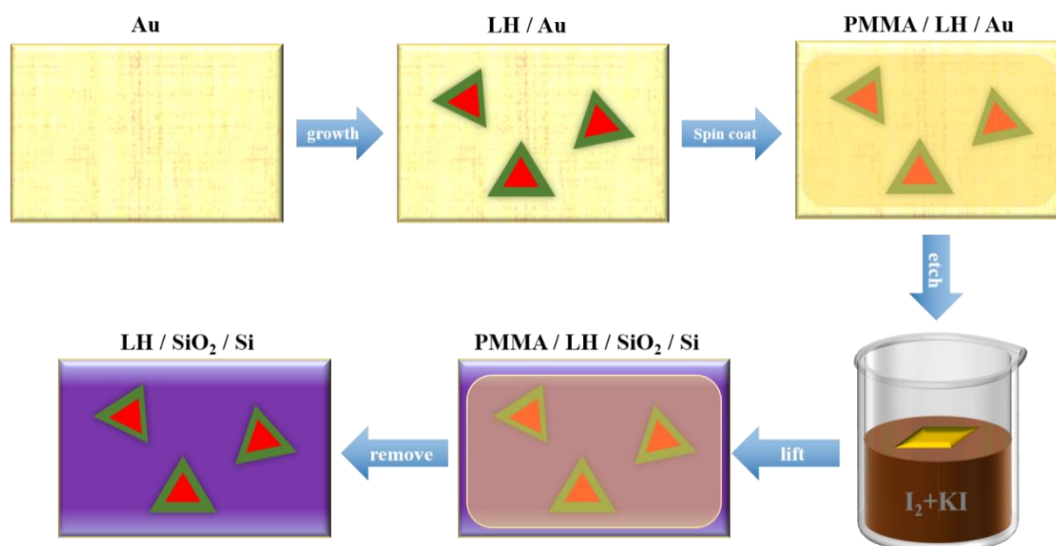


Figure S2. Schematic diagrams of the growth of WS₂/MoS₂ LHs on Au foil and wet transfer from the Au foil onto a SiO₂/Si substrate.

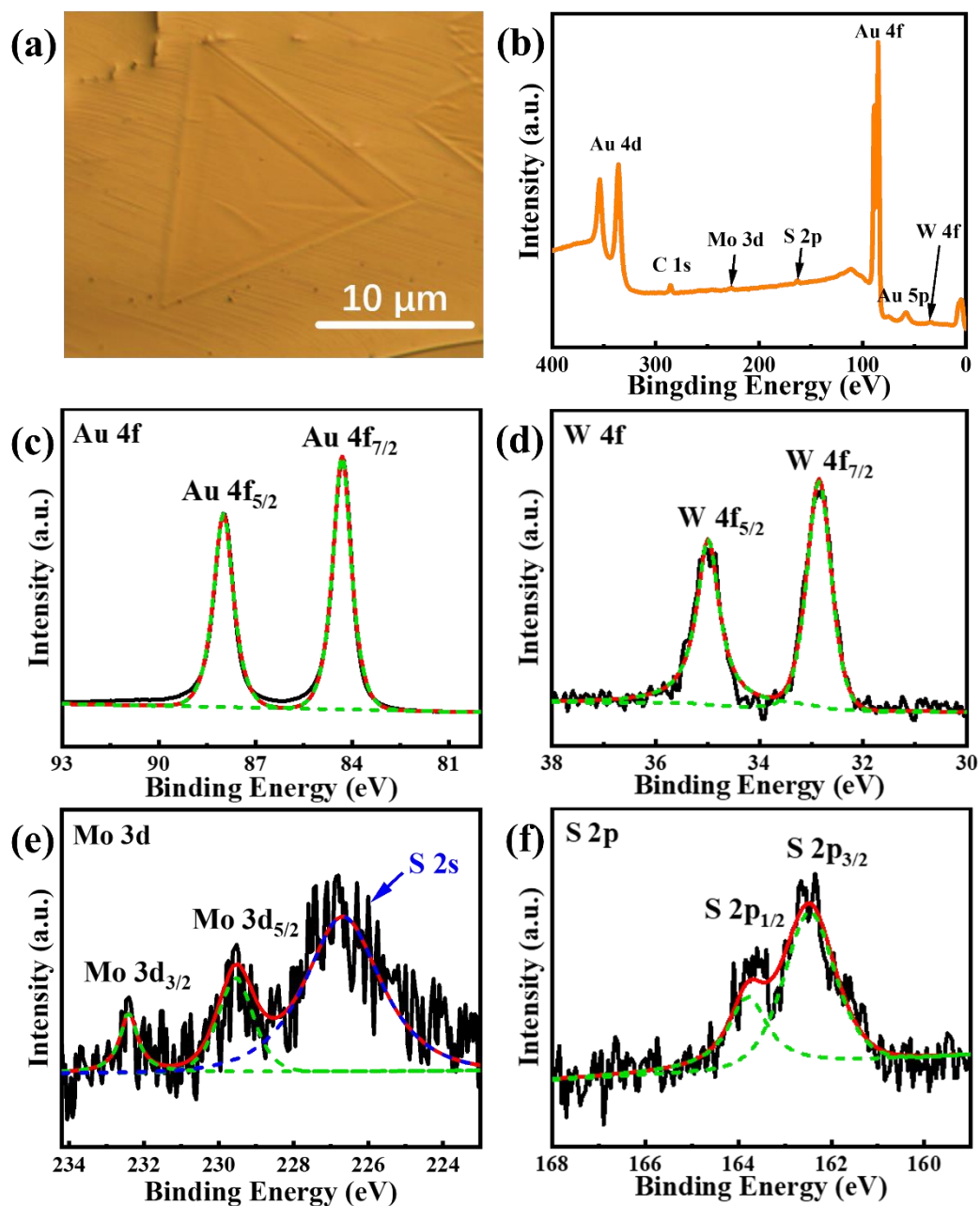


Figure S3. (a) Optical microscopic image of the CVD-grown MoS_2/WS_2 LH on Au foil. (b) XPS spectrum of the heterojunction in (a). (c–f) XPS spectra of Au 4f (c), W 4f (d), Mo 3d (e) and S 2p (f) orbitals, respectively.

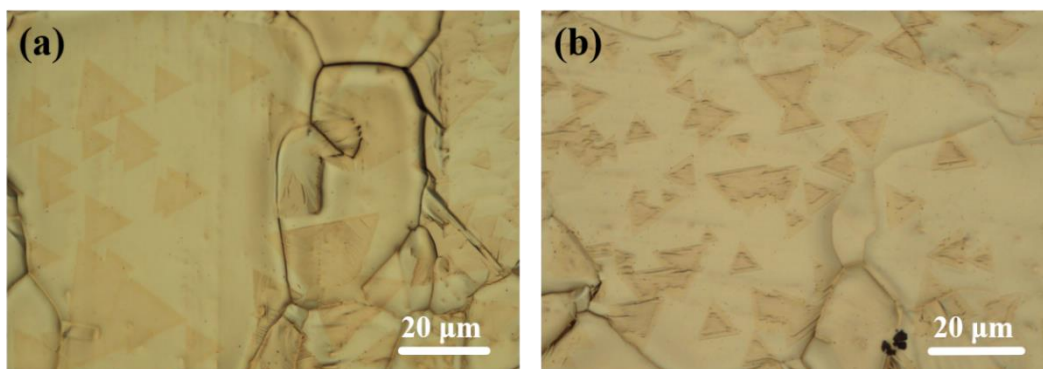


Figure S4. Low-magnification optical microscopic images of the as-grown (a) WS₂/MoS₂ LHs and (b) WS₂/MoS₂ VHs on Au foils, respectively.

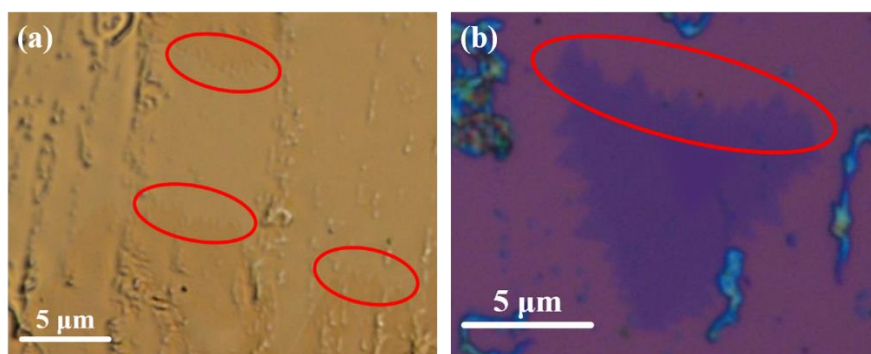


Figure S5. Optical microscopic images of as-growth MoS_2/WS_2 VHS (a) growth on Au foils and as-transferred MoS_2/WS_2 VH (b) on SiO_2/Si , respectively.

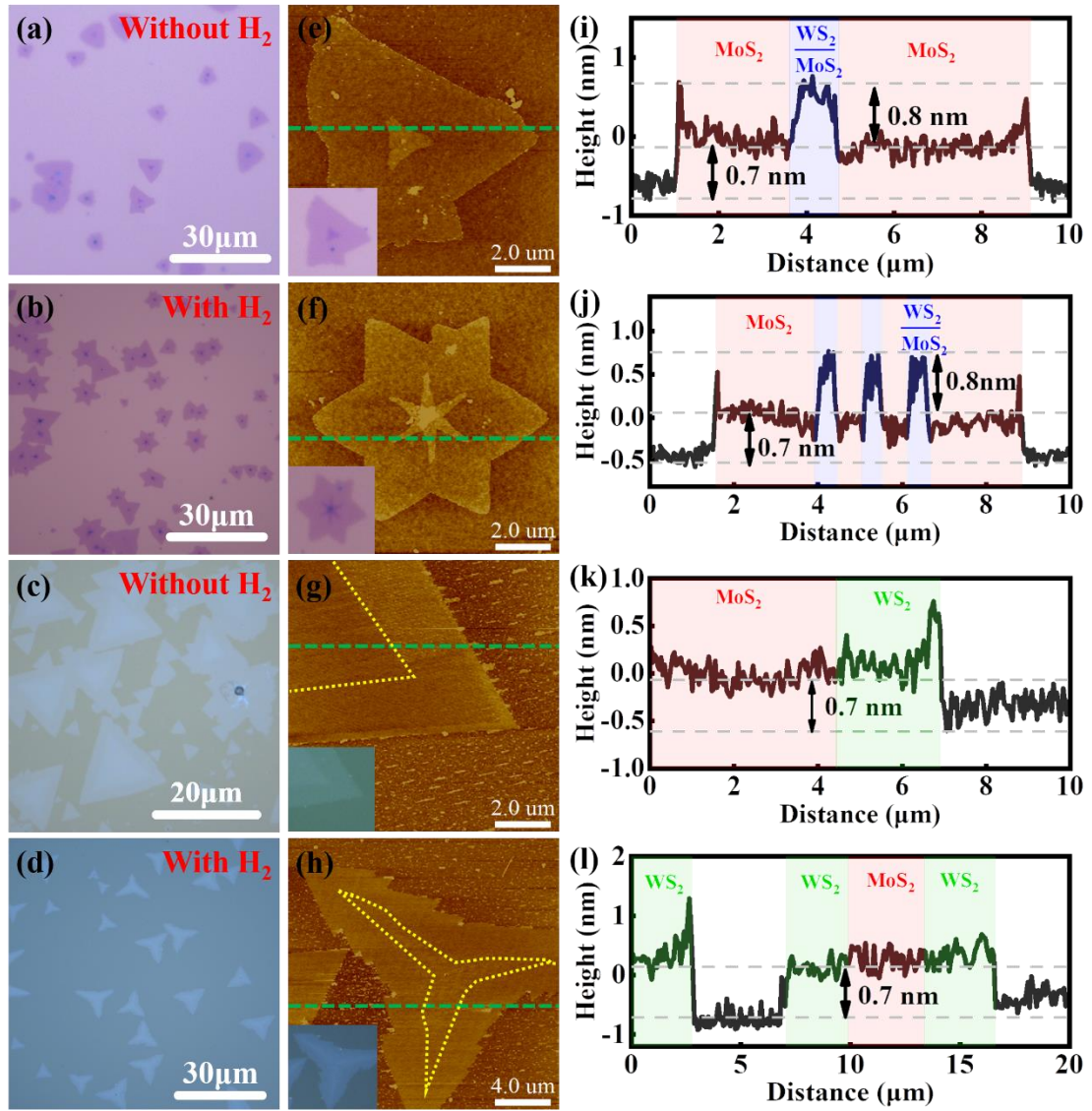


Figure S6. (a–d) Optical microscopic images of the synthesis LHs and VHs on SiO₂/Si and c-sapphire substrates depending on whether or not hydrogen is supplied. (e–h) AFM images of as-growth MoS₂/WS₂ LH and VH domains corresponding to (a–d). (i–l) AFM profiles along green dash line in (e–h), respectively.