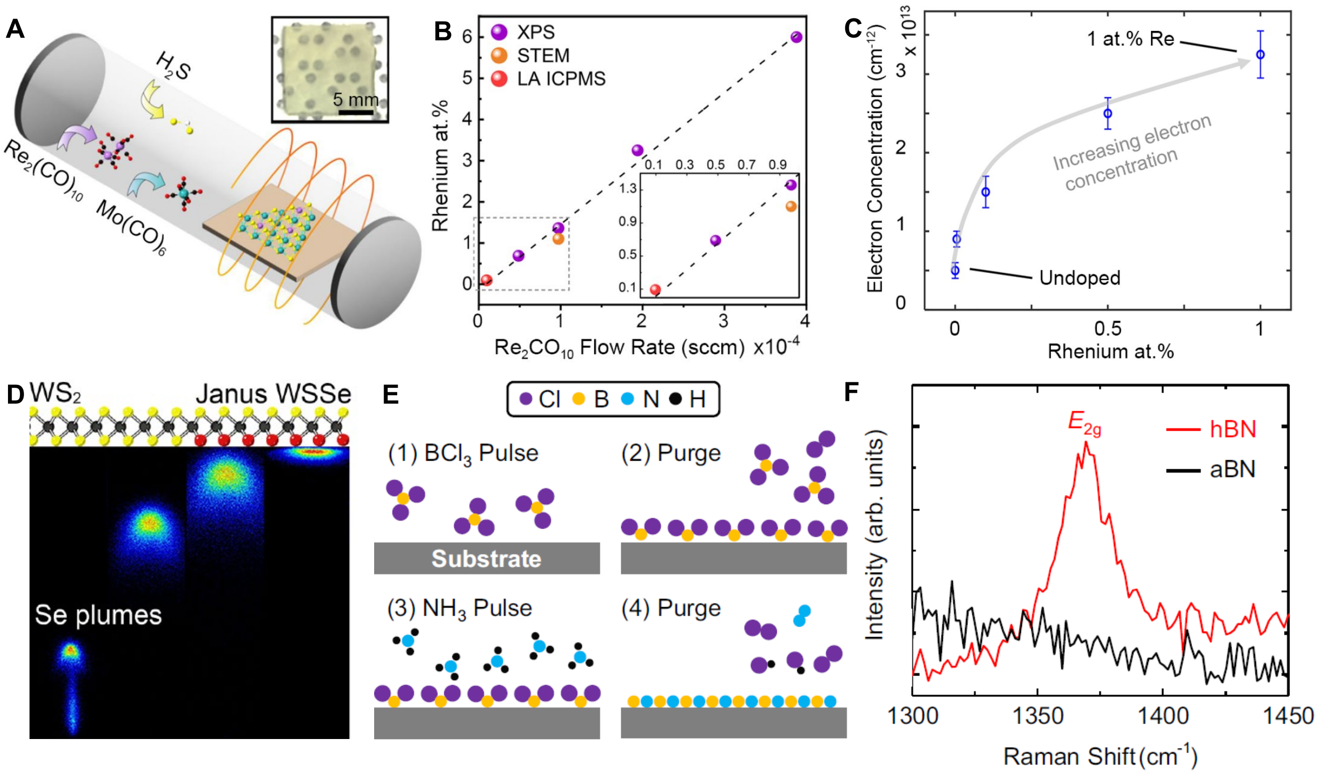

Abstract figure: A. MOCVD for synthesis and doping of 2D MoS_2. REF.[1] **B.** Doping concentrations can be controlled by the flow rate of metalorganic precursors containing dopants. REF.[1] **C.** Electron concentrations in MoS_2 can be controlled by Rhenium dopant atomic %. REF.[1] **D.** Low-energy elemental implantation for synthesis of 2D Janus WSSe crystals was demonstrated using PLD. **E.** ALD for amorphous BN deposited at ≤ 250 °C. REF.[3] **F.** Raman spectral comparison between CVD-grown hBN and our ALD-grown aBN in the range between 1300 and 1450 cm^{-1}. REF.[3] (REF.[1] *ACS Nano* **2023**, *17*, 15629–15640; REF.[2] *ACS Nano* **2020**, *14*, 3896–3906; REF.[3] *Nat. Comm.* **2024** *15*, 4016.)