## Formation Mechanism of 2D $SnS_2$ and SnS by Chemical Vapor Deposition using $SnCl_4$ and $H_2S$

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**Table S1.** Thermodynamic data for the calculation of changes in Gibbs free energy for different possible reactions in the CVD process using SnCl<sub>4</sub> and  $H_2S$ .<sup>1-3</sup>

Species	Phase	$\Delta H_f^0$ (kJ/mol)	$S^{0}(\mathbf{J/mol} \cdot K)$
SnCl <sub>4</sub>	Liquid	-478.47	366.89
H <sub>2</sub> S	Gas	-20.5	205.6
SnS <sub>2</sub>	Hexagonal	-153.6	87.4
SnS	Orthorhombic	-107.9	77
HCl	Gas	-92.31	186.9
S <sub>2</sub>	Gas	128.6	228.1
H <sub>2</sub>	Gas	0	130.68

**Figure S1.** Images of the reactor for the CVD of  $SnS_x$  using  $SnCl_4$  and  $H_2S$  in this work. (a) Reactor without deposition of sulfur. (b) Reactor after the CVD of SnS, where the presence of yellow products on the inner wall of reactor indicates the deposition of elemental sulfur.



Reference

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