

ARTICLE

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Self-Limiting Stoichiometry in SnSe Thin Films

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Supporting Information

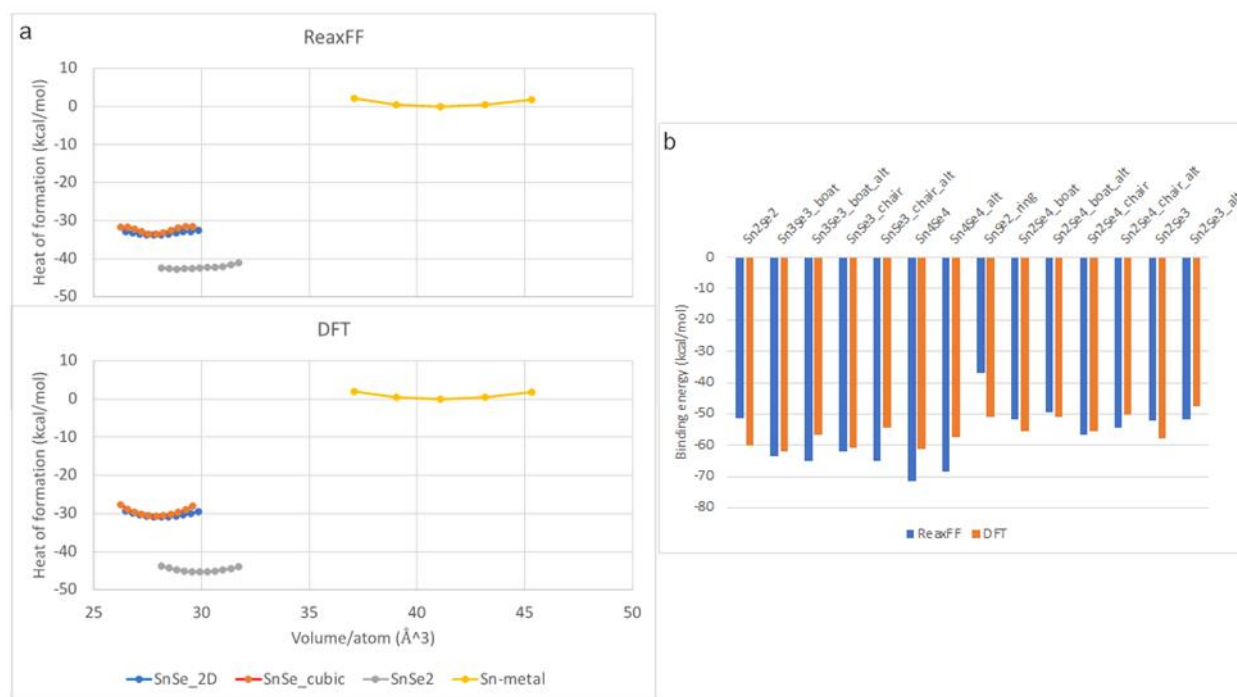


Fig. S1 Free energy plot as a function of composition showing (a) Heats of formation and Equations of state for SnSe_n crystals where $n=0, 1, 2$; and (b) Binding energies of Sn_xSe_y clusters.

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†Electronic Supplementary Information (ESI) available: [details of any supplementary information available should be included here]. See DOI: 10.1039/x0xx00000x

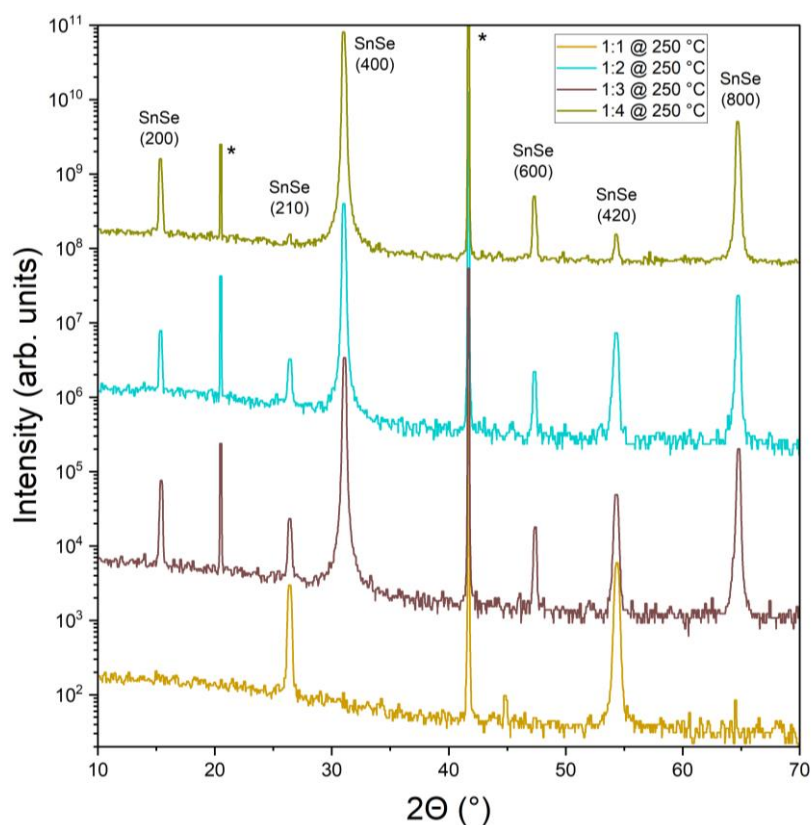


Fig. S2 XRD of SnSe grown on Al_2O_3 for 83 min at 250 °C with a range of flux ratio from 1:1-1:4.

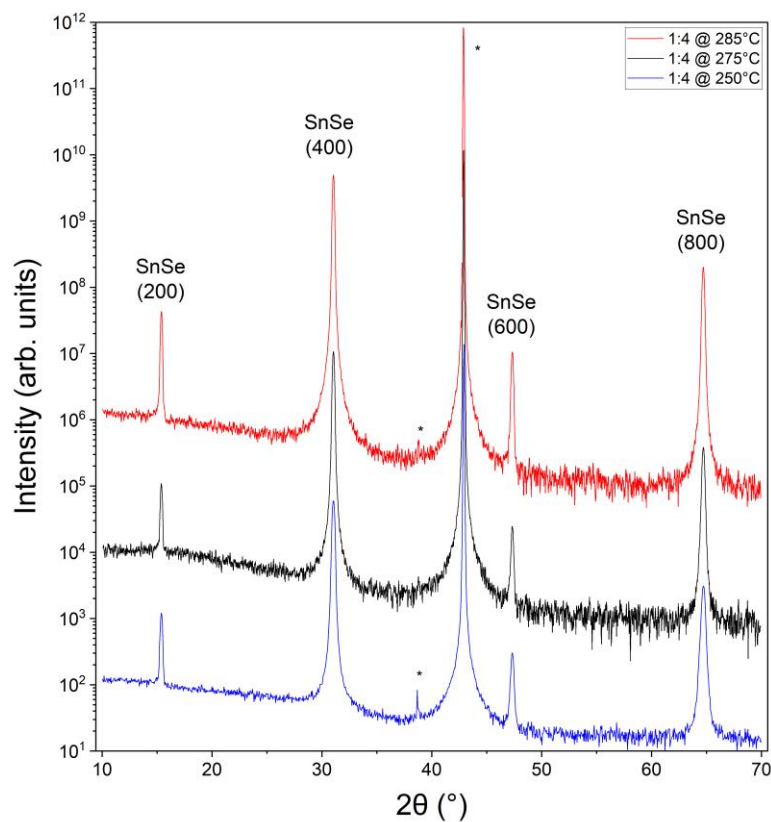


Fig. S3 XRD of SnSe grown on MgO for 83 min at temperatures ranging from 250-285 °C

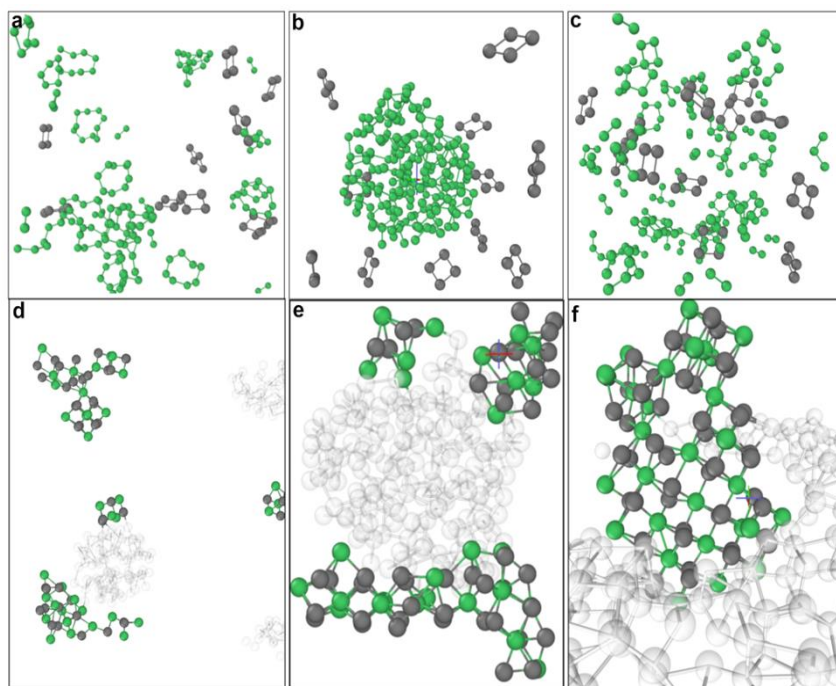


Fig. S4 The crystal growth of SnSe at 500K depending on different cluster sizes of Se precursors. (a, b, c) Initial and (d, e, f) final configurations of systems of interest.

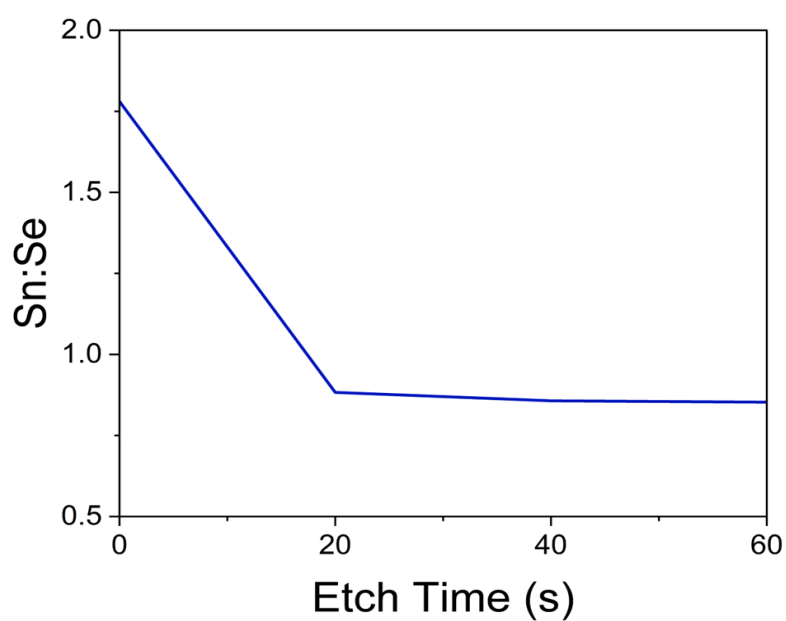


Fig. S5 ToF-SIMS depth profile showing the change in Sn:Se counts ratio as a function of etch time.

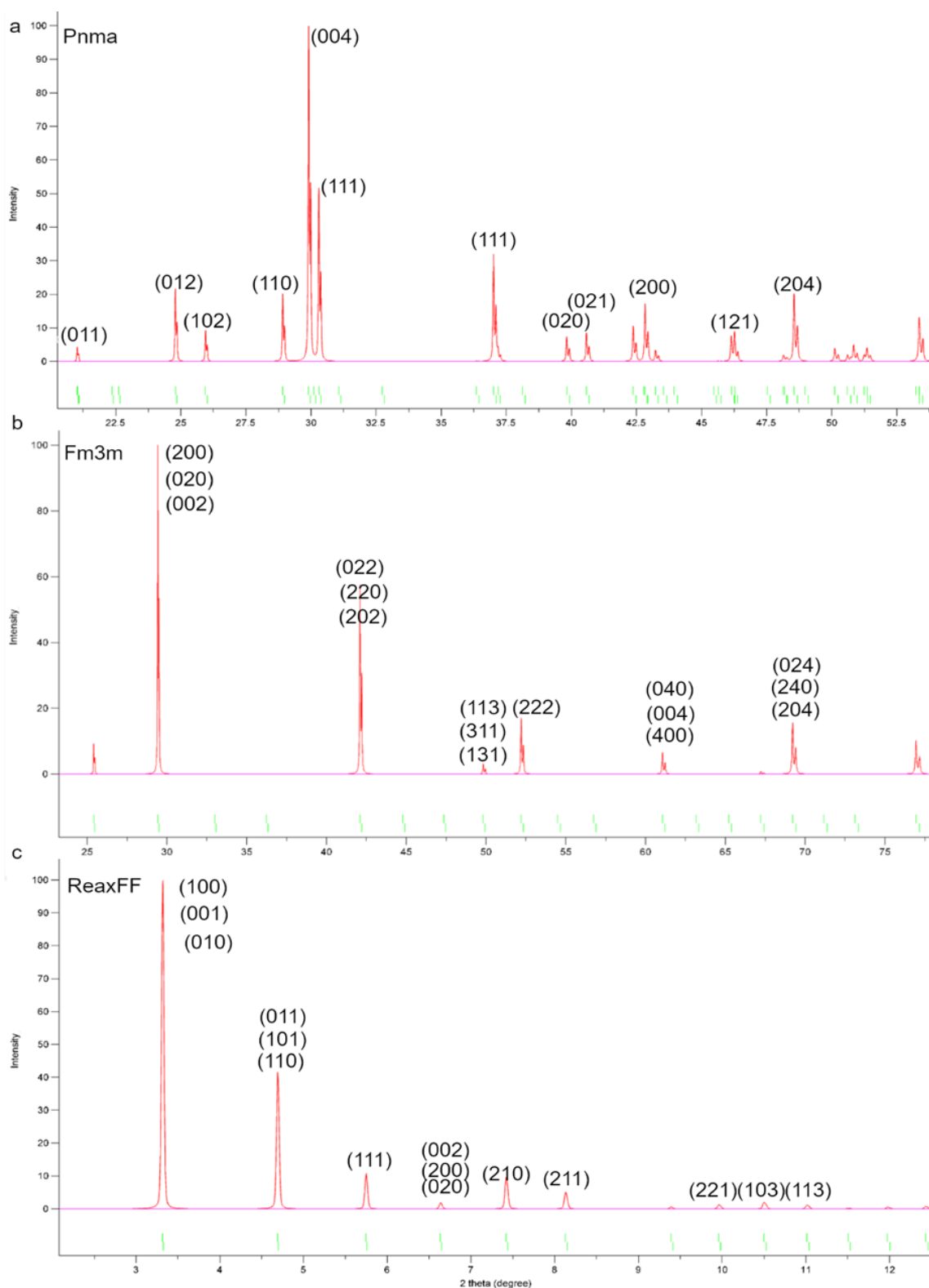


Fig. S6 Computed powder X-ray diffraction patterns of (a) *Pnma*, (b) *Fm3m* and (c) the ReaxFF-generated structure in Fig. S4-f using VESTA⁵⁵.

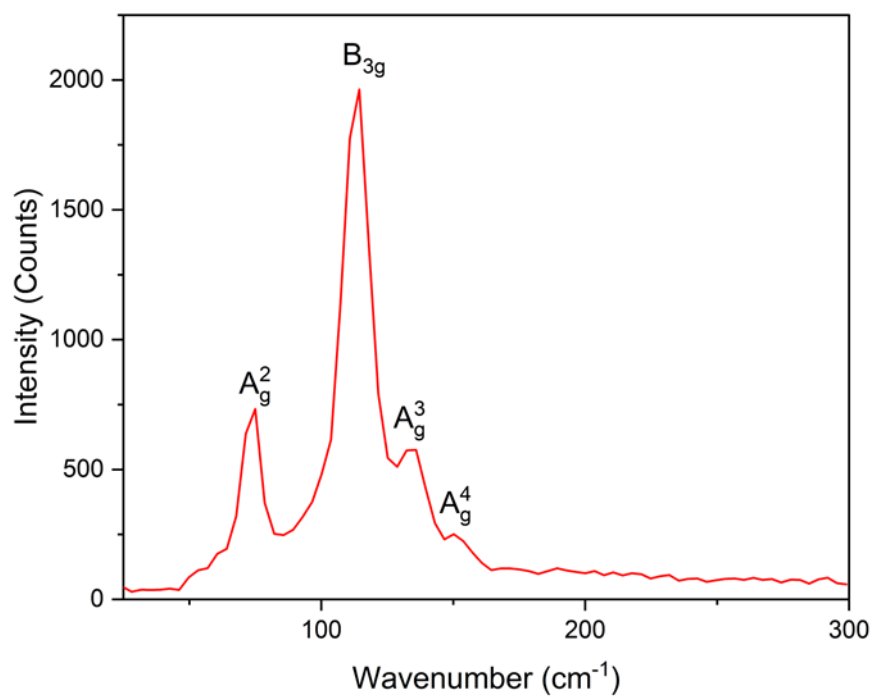


Fig. S7 Raman spectra of SnSe bulk single crystal sourced from 2D Semiconductors as a control. The SnSe_2 A_g mode at 185 cm^{-1} is not present. The Renishaw Raman spectrometer used to capture this spectrum has a cutoff filter below 50 cm^{-1} that obscures the A_{1g} mode.