

Supporting Information

Chlorides-assisted Synthesis of tellurene on arbitrary substrate: growth mechanism, thermal properties, and device applications

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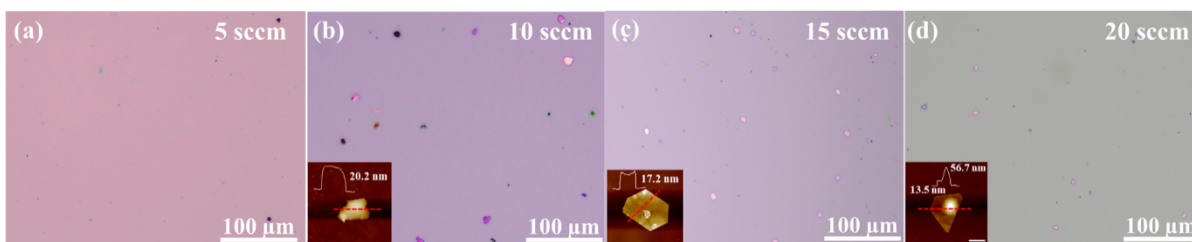


Figure S1 Tellurene flakes synthesized at 750 °C with the pure hydrogen of (a) 5 (b) 10 (c) 15 (d) 20 sccm.

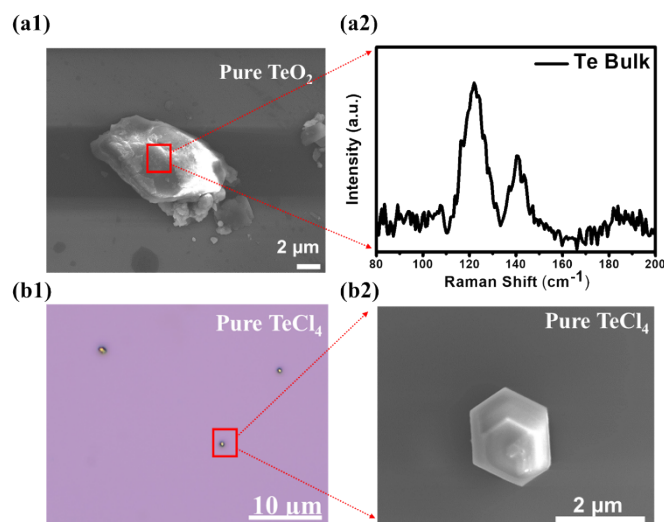


Figure S2 (a1) Formation of Te bulk by using solely TeO_2 as precursors *via* CVD process. (a2) The corresponding Raman spectrum. (b1) Formation of Te nanowires by using solely TeCl_4 as precursors *via* CVD process. (b2) Zoomed-in SEM image, observed the preferred orientation of growth along z-axis.

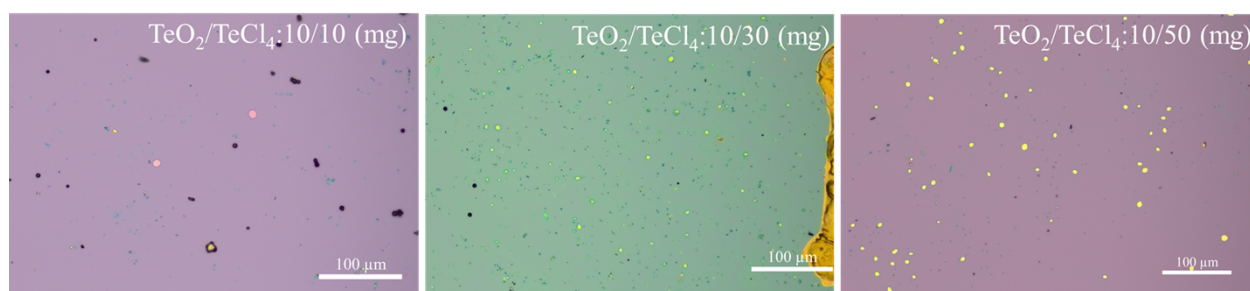


Figure S3 OM images of tellurene by controlling the ratio of $\text{TeO}_2/\text{TeCl}_4$ with 10/10, 10/30 and 10/50 mg through reduction process.

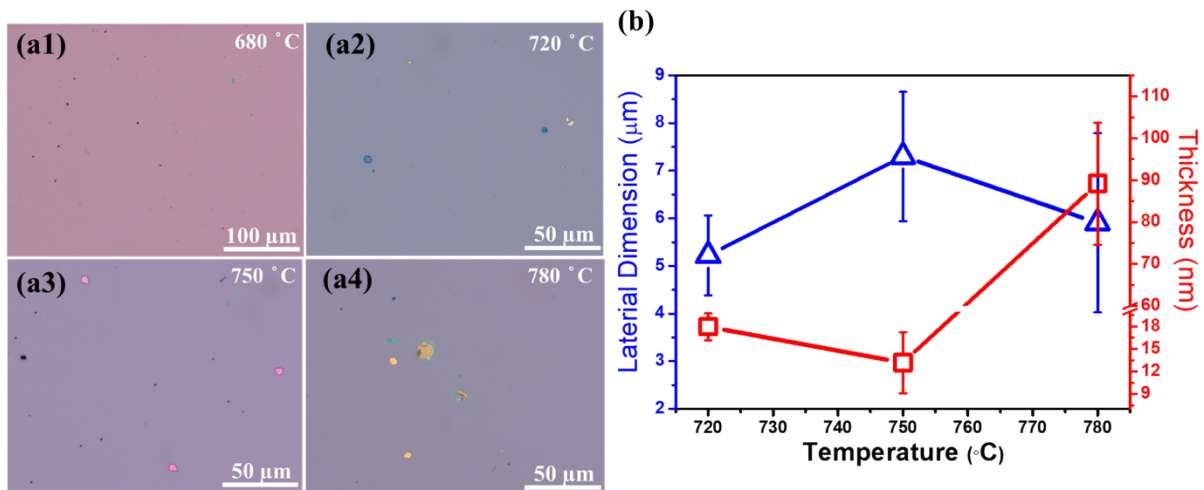


Figure S4 Tellurene flakes synthesized at (a1) 680 °C. (a2) 720 °C. (a3) 750 °C. (a4) 780 °C. (b) The dependance of lateral size and thickness with the varied temperature.

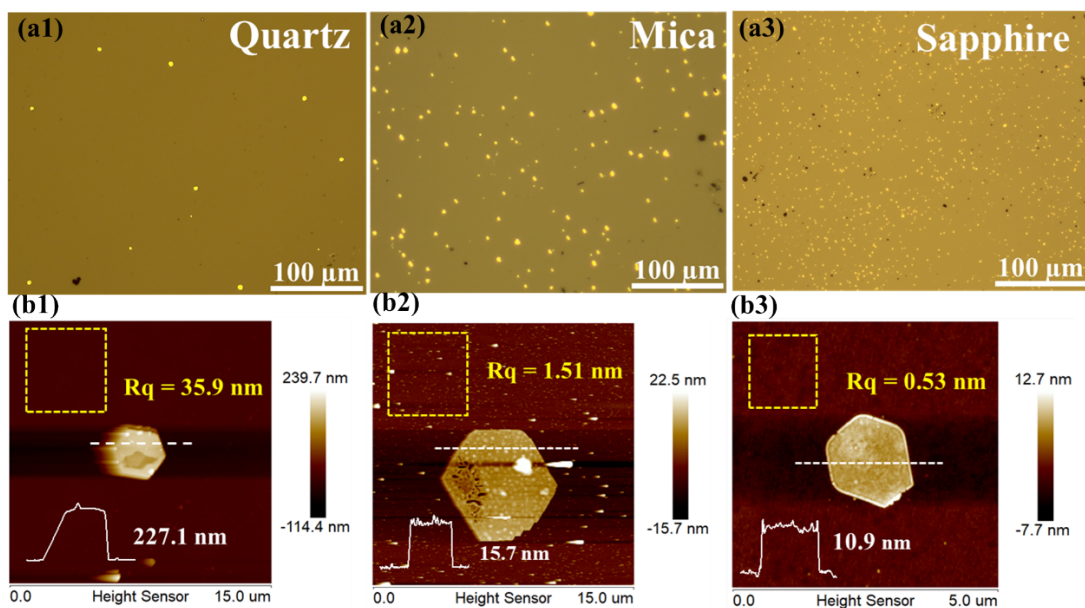


Figure S5 Synthesis of tellurene on (a1) Quartz. (a2) Mica. (a3) Sapphire. The corresponding AFM results of tellurene synthesized on (b1) Quartz. (b2) Mica. (b3) Sapphire.

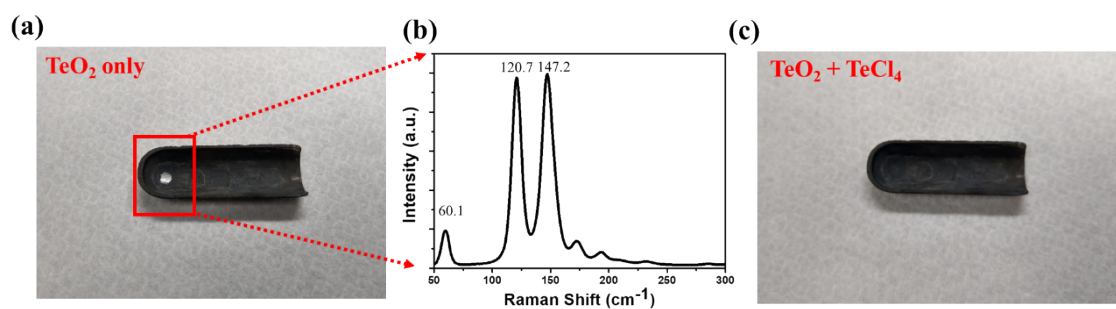


Figure S6 (a) Optical image of boat which initially placed only TeO_2 after CVD process. (b) Corresponding Raman spectrum of residues after CVD process. (c) Optical image of the boat where initially placed the mixture of TeO_2 and TeCl_4 through CVD process.