

The black-phosphorus crystal growth model deduced from the product distribution state under different process factors

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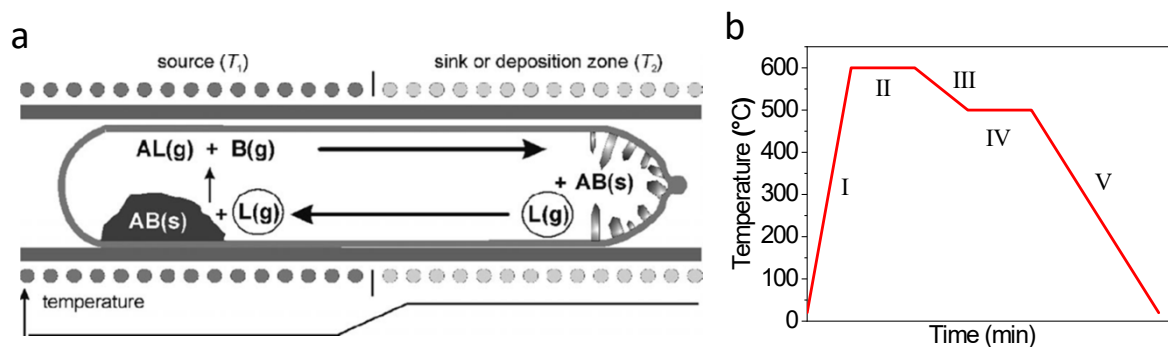


Fig. S1 (a) Schematic diagram of the transport process of substances by CVD method proposed by Schäfer; (b) Temperature program including five stages.

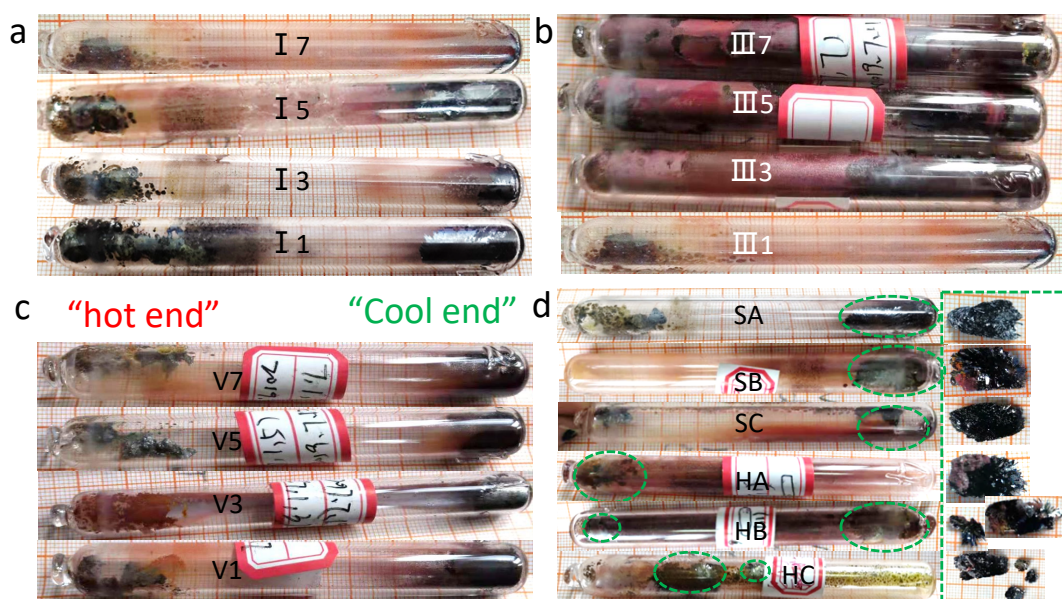


Fig. S2 Quartz tube photographs reflect (a) effect of temperature increasing rate on BP synthesis and yield in temperature stage I; (b) effect of temperature decreasing rate on BP synthesis and yield in temperature stage III; (c) effect of cooling rate on BP synthesis and yield in temperature stage V. (d) Quartz tube photographs under six types in Fig. S3.

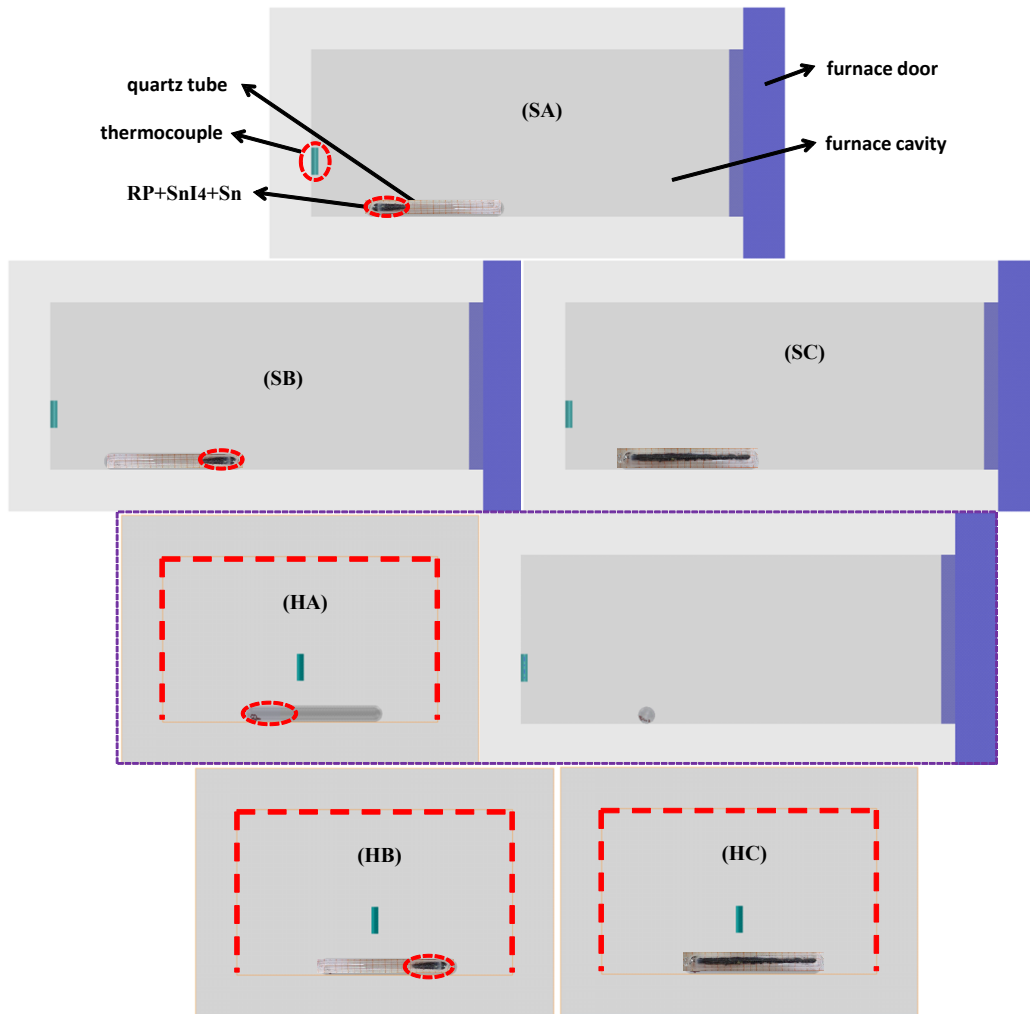


Fig. S3 The raw-material-distribution in quartz tube and quartz-tube- placement in muffle furnace: (SA) means that the raw materials are gathered at one end of the quartz tube, and material-gathered end of the quartz tube is placed away from the furnace door, and the quartz tube is placed longitudinally along the furnace chamber; (SB) means that raw materials are gathered at one end of the quartz tube, and the material-gathered end of the quartz tube is close to the furnace door, and the quartz tube is placed longitudinally along the furnace chamber; (SC) represents the raw materials are laid in the quartz tube, and the quartz tube is placed longitudinally along the furnace chamber; (HA) represents that the raw materials are gathered at one end of the quartz tube, and the quartz tube is placed laterally along the furnace chamber, and material-gathered end of the quartz tube faces to the left; (HB) means that the raw materials are gathered at one end of the quartz tube, and the quartz tube is placed laterally along the furnace chamber, and material-gathered end of the quartz tube faces to the right; (HC) means the raw materials are laid in the quartz tube, and the quartz tube is placed laterally along the furnace chamber.