Supporting Information for

Crystallization kinetics of amorphous red phosphorus to black phosphorus by chemical vapor transport

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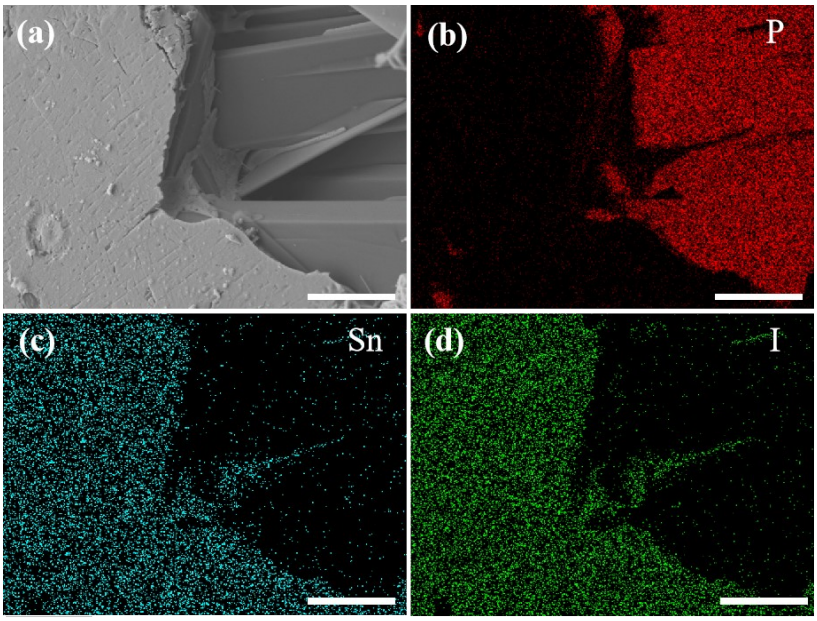

Fig. S1 (a) SEM image of the nucleating agent and (b-d) corresponding element mappig of the nucleating agent shown in (a). The scale bars are 25 μm.

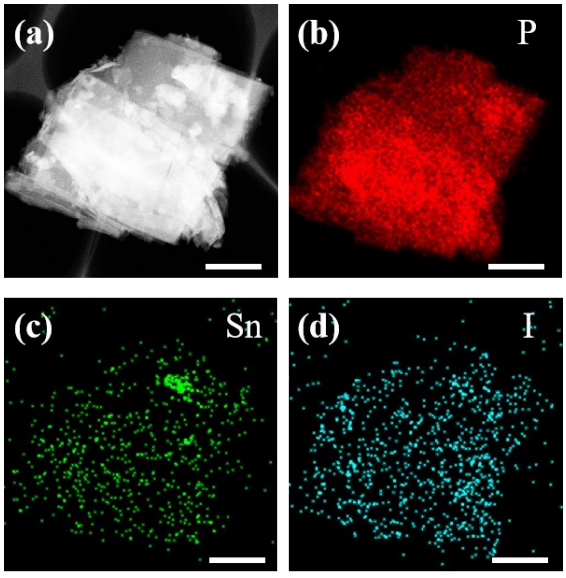

Fig. S2 (a) STEM image of the nucleating agent and (b-d) corresponding element mappig of the nucleating agent shown in (a). The scale bars are 1 μm.

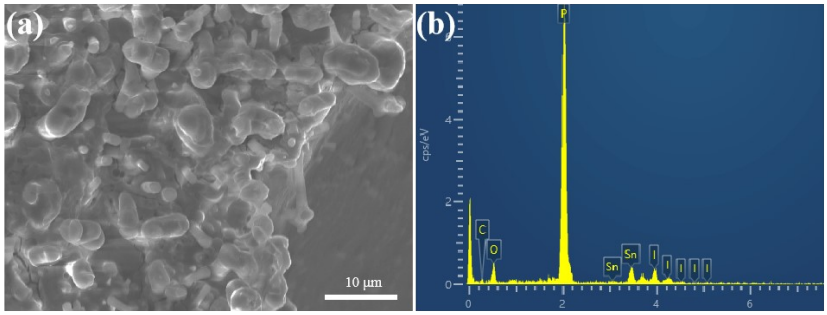

Fig. S3 (a) SEM image of the product of the interrupted experiment at 560 ℃. (b) The representative EDX spectrum in (a). Accordingly, the molar ratio of Sn:I is determined as ~3:1.

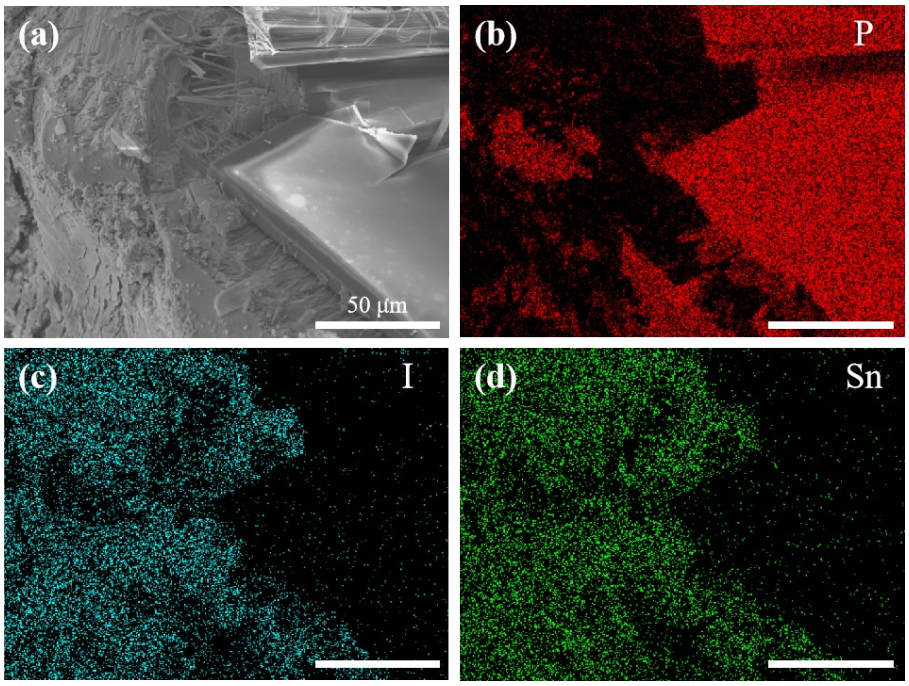

Fig. S4 The SEM image of the product obtained after the experiment was interrupted at 550 ℃ and the EDS spectrum of the corresponding element distribution

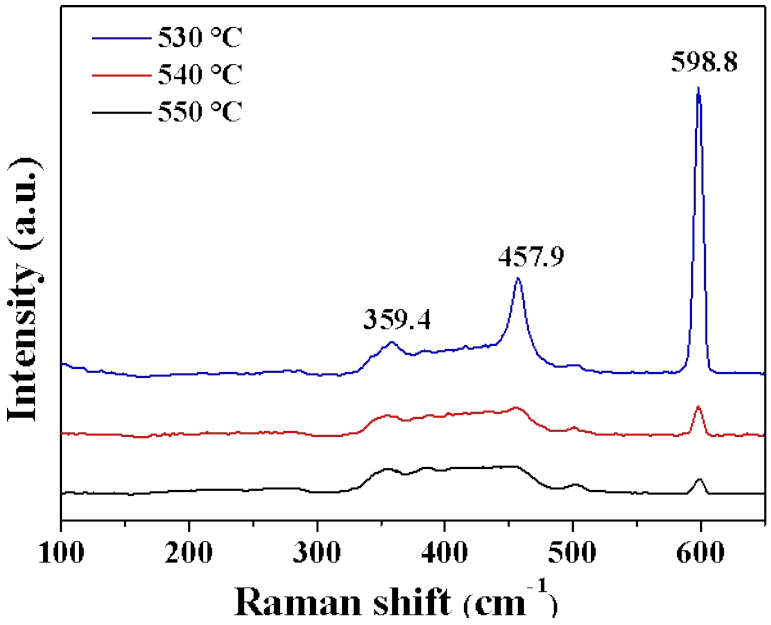

Fig. S5 The Raman spectra of the product on the right side of the ampoule at different temperatures in the reaction interruption experiment.

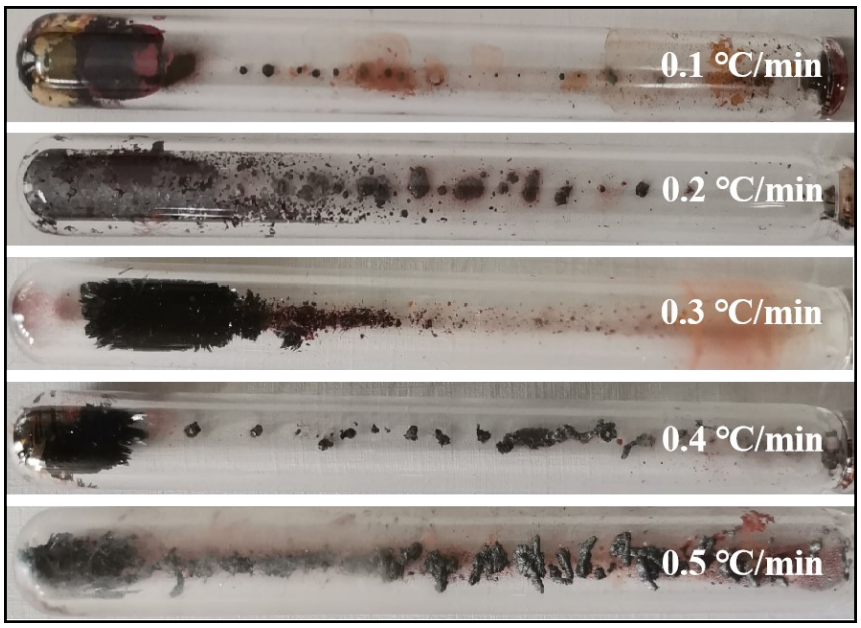

Fig. S6 Optical images of the phosphorous structure produced by the mixture of aRP, Sn and I_2 at different reaction rates during the cooling stage at 560 to 540 °C.