

[Supplementary Information]

Flower-shaped PdI₂ nanomaterials with remarkable surface-enhanced Raman scattering activity

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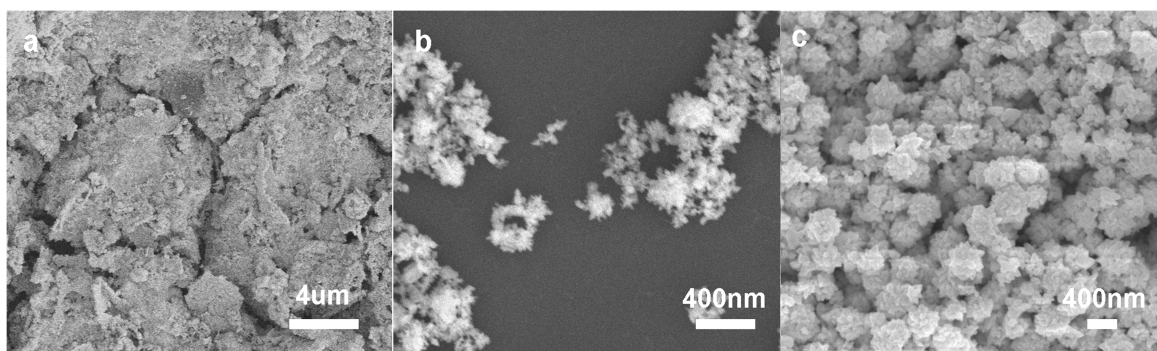


Fig. S1. SEM images of prepared PdI₂ at different quantity of KI

(a: 0.1mmol; b: 0.3mmol; c: 0.7mmol; 0.5mmol see Fig. 3).

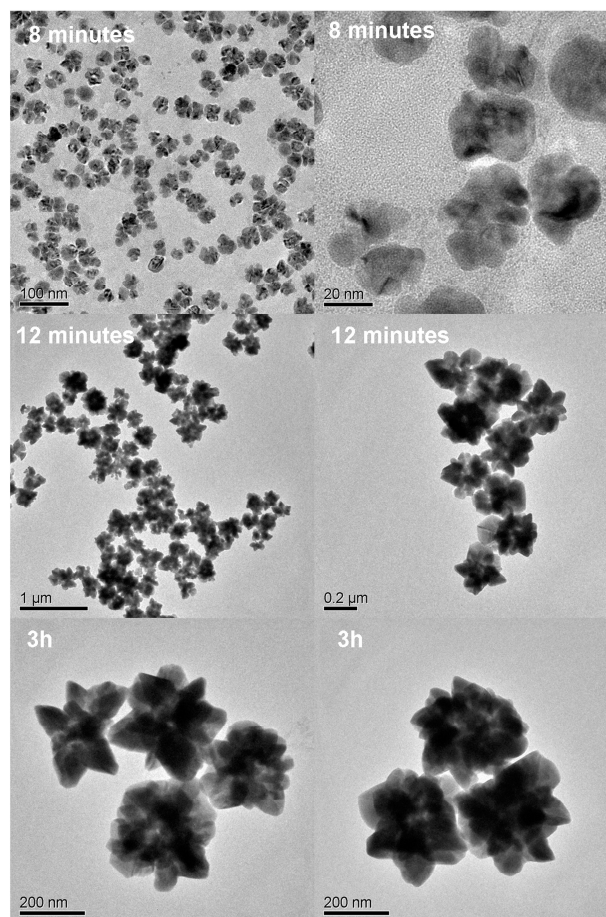


Fig. S2 Different reactive intervals of typical synthetic procedure

The formation of the flower-shaped PdI_2 can be divided into three periods according to reactive temperatures, which were initial temperature, transitionary temperature, and final temperature. (1) In the first step (initial temperature), the color of the solution turned from colorless to black immediately after adding the palladium acetate solution at 60°C , this means the reaction was started at this stage. Then the reaction temperature was kept unchanged for half an hour. (2) Subsequently, the temperature was elevated from 60 - 130°C (transitionary temperature), during this procedure, we selected different time interval (4 minutes, 8 minutes, 12 minutes) as objective to investigate the transitionary morphology. (a) At 4 minutes, no PdI_2 was observed by using TEM, we consider this phenomenon can be ascribed to the soluble balance, that is, the product (PdI_2) maybe very small

size at this time interval, these small nanoparticles can easily dissolve into the solution due to the existing of KI ($\text{PdI}_2 + 2\text{KI} \rightarrow \text{K}_2\text{PdI}_4$). (b) At 8 minutes (see Fig. 1), we can easily recognize the product in high yield, the size of nanoparticles was about 20nm. In addition, we can clearly observe the flower-shaped morphology and corresponding petals, which means the small nanoparticles assembly into flower-shaped morphology. (c) At 12 minutes (the temperature reached 130°C), the bigger size of flower-shaped product can be obtained from the solution (see Fig 1), which size can reached 250 nm, this phenomenon once again confirmed the formation of flower-shaped morphology was based on self-assembly. (3) After the reaction was kept at 130°C for 3 hours (final temperature), the product possess monodispersity and the size was about 400nm (Fig. 1). That is because the Ostwald ripening process was dominant after prolonging the reactive time, which led to the dissolution of small PdI_2 nanoparticles in favor of the growth of large ones.