

Supporting Information

Development of Solvent-Free Hydrogen Storage and Release System based on Semi-Solid-State Ammonia Borane (AB) Fuel: High Gravimetric Capacity and Feasibility for Practical Application

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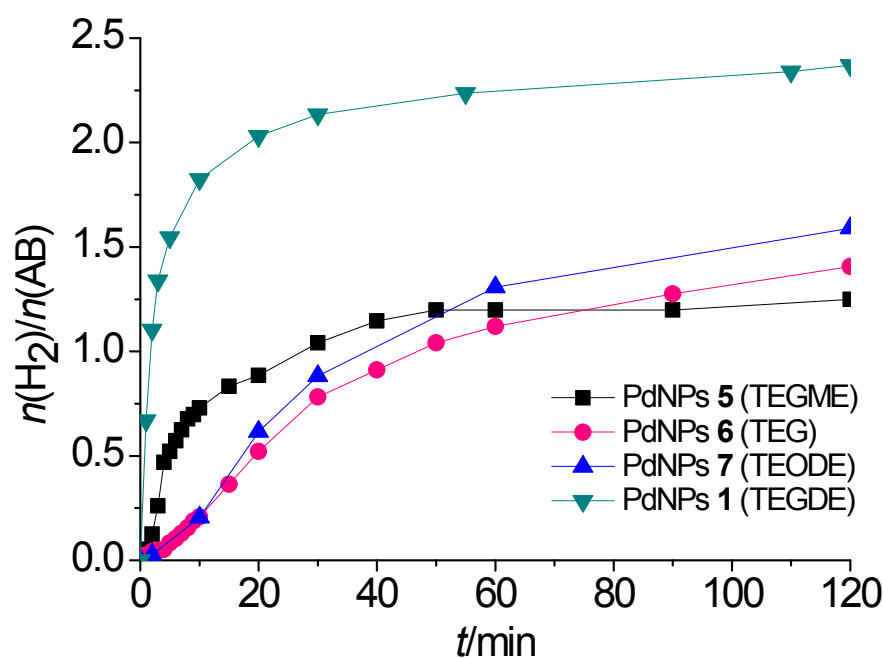


Fig. S1 AB dehydrogenation kinetic profiles by PdNPs in **5** (TEGME), **6** (TEG), **7** (TEODE), and **1** (TEGDE).

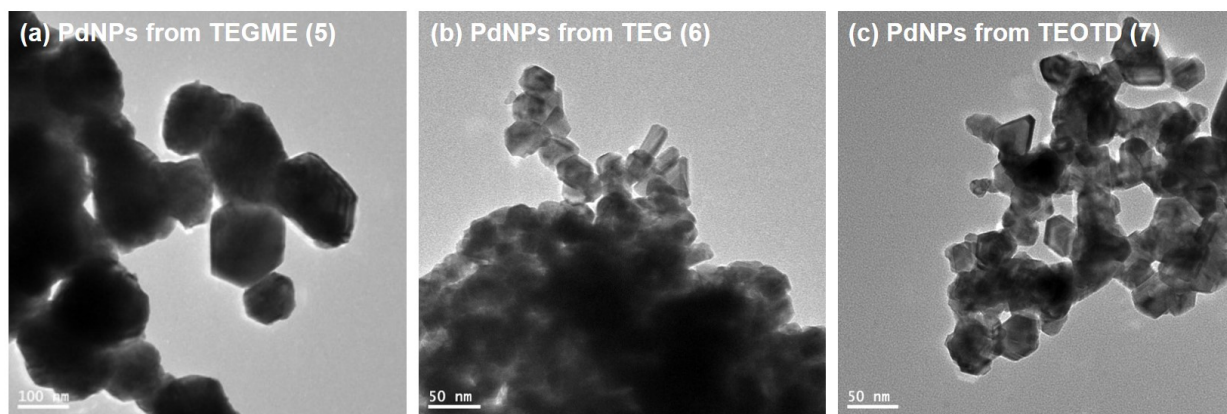


Fig. S2 TEM images of PdNPs (**5–7** and **1**) prepared in TEGME, TEG, TEOTD, and TEGDE. [Scale bar: 100 nm (a), 50 nm (b) and (c)].

The PdNPs **5** prepared from TEGME are broadly classified into two types of species with different appearance among samples: the first family of nanoobjects observed was formed of nano-polyhedra; the second family of particles revealed a hexagonal aspect on TEM picture. All PdNPs **5** show a broad size distribution ranging from 50 to 100 nm. For the PdNPs **6** from TEG, the hexagonal nanoplates are observed as one of the main kinds of prepared NPs. Their average edge length is 15 nm. The rod-like particles are formed by the anisotropic growth of multiply-twinned particles. The directional growth is most likely due to a selective adsorption of the surfactant TEG stabilizing $\{100\}$ facets and inhibiting their growth rate at the same time. These nano-rods present a length comprised between 30 and 40 nm while these particles have a diameter between 10 and 15 nm. Triangular type of particles with an average edge length of 40 nm is also partially observed on TEM image of PdNPs **6**. In the TEM image of PdNPs **7** prepared from TEOTD, mainly found is two types of triangular and hexagonal nanoplate with an average edge length of 40 and 20 nm, respectively (see Fig. S2c).

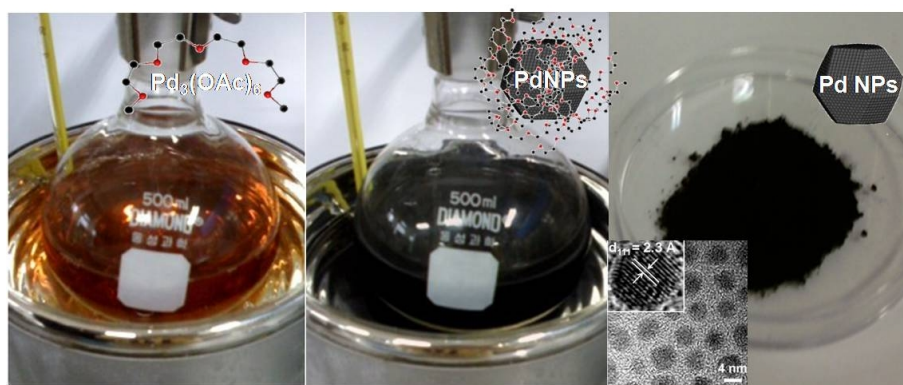


Fig. S3 Large scale synthesis of PdNPs.