

Au/Pd Nanoparticles Immobilized on TiO₂/Graphene as a Functionally Catalyzed membranes

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Abstract: A novel catalytic membrane was fabricated with Au/Pd nanoparticles produced by a novel blast method (Figure 1) following the supported by TiO₂ graphene, where the TiO₂ graphene were then synthesized on the ceramic membrane. The obtained activation energy was much lower than the values before, implying that the p-nitrophenol reduction could take place more easily on our system compared to others. A flow-through catalytic membrane reactor was developed for testing the catalytic properties. The effect was investigated in detail and to meet the need of the optimal conditions. The characterization results highlighted that the as-prepared bouquet-like TiO₂ nanotubes could significantly improve the loading amount and also for the degree of Au/Pd nanoparticle dispersity as well as the size of particles. In addition, this catalytic membrane exhibited much more improved activity and stability, with a full conversion of p-nitrophenol and no loss in catalytic activity with several times running.

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FIGURES

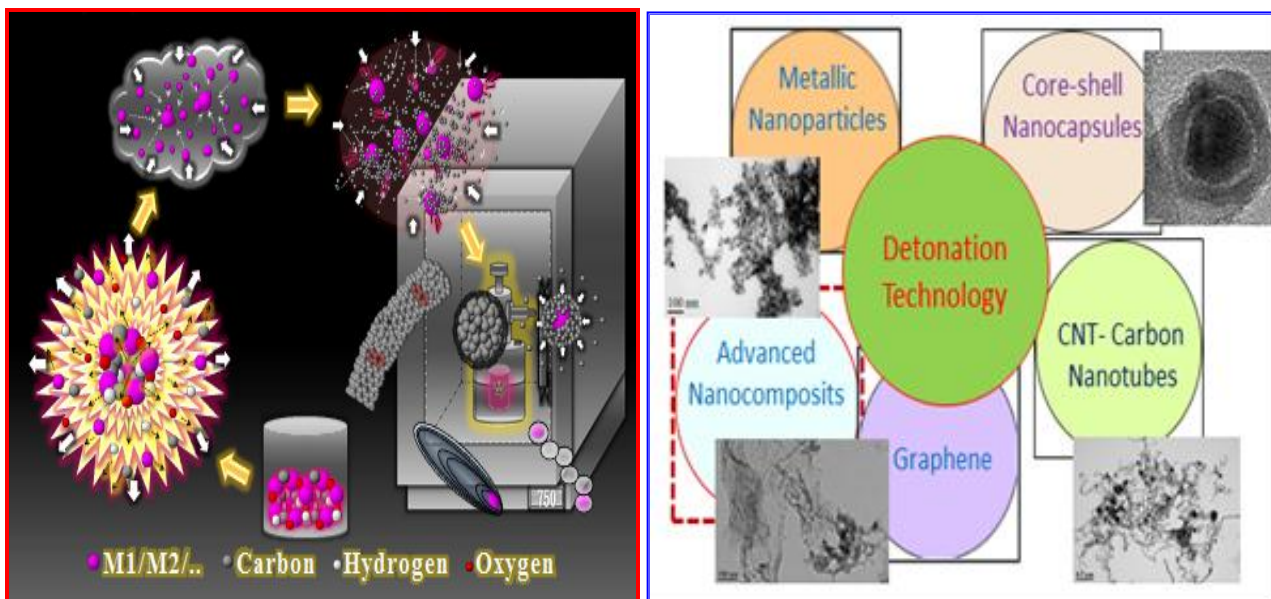


Figure 1: Reaction schematic diagram (left) and these nanostructured applications (right) through the blast of CHNO energetic materials over different metal-catalysts.