

Microfluidic preparation of encapsulated Pt nanoparticles in microcapsules for highly active and stable catalysts

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We show an efficient microfluidic method to encapsulate colloidal Pt nanoparticle in double emulsion droplets. And then, by in-situ photopolymerization, we can easily produce Pt-encapsulated monodisperse microcapsule without loss of the Pt nanoparticles. Most studies in the field of catalyst have only focused on improvement of catalytic activity of active metal by encapsulation. However previous studied method is limited in that it requires complicated process, low encapsulation yield of metal, sintering, leaching and poor reusability. To best our knowledge, this manuscript represents that the Pt-encapsulated microcapsule can permits excellent catalytic activity, leaching-proof nature, and high reusability in comparison to quasi-homogeneous catalyst. Further, reaction performance can readily controlled by adjusting size of the Pt-encapsulated microcapsule. Therefore, we believe that the results and methodologies reported here represent a significant step toward simple fabrication of the highly active and stable catalyst with 100% encapsulation yield of metal.