Surface charge-directed selective and outstanding catalytic activities of porous M@UiO-66 composites (M = Pt or Ag) for reduction of organic pollutants

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The agglomeration of active metal nanoparticles during catalytic reactions, which is affected by their high surface energy, is a major limitation to their practical utilization. Construction of porous composites incorporating active metal nanocatalysts is greatly important to stabilize active metal nanocatalysts. Within this aspect, metal–organic frameworks (MOFs) are excellent supports candidate to stabilize unstable metal nanocatalysts. Herein, we report the production of UiO-66-based porous composites (M@UiO-66, M = Pt or Ag) containing catalytically active metal nanocatalysts by converting metal ions to metal nanoparticles via the one-step thermal treatment of UiO-66/M^{n+} (M^{n+} = Pt^{2+} or Ag^{+}). M@UiO-66 composites pose well-dispersed metal nanocatalysts within well-developed micropores of UiO-66. Especially, these composites pose the specific surface charge due to metal nanocatalysts. As a result, M@UiO-66 not only exhibit great activity and selectivity of the organic pollutants, but also demonstrate excellent recyclability for the reduction of the organic pollutants.[1]

Reference

[1] Oh S et al. Surface Charge-Directed Efficient and Selective Catalytic Activities of Porous M@UiO-66 Composites (M = Pt or Ag) for Reduction of Organic Pollutants. Inorg Chem. 2022;61(41):16501-16508.