**Supporting information**

**Modification with ultrasonication for enhanced properties of Cobalt-based zeolitic imidazolate framework**

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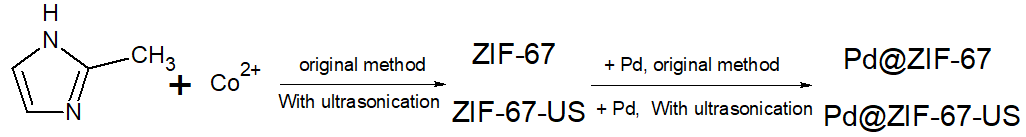
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Scheme S1. Synthesis process of ZIF-67-US and Pd@ZIF-67-US



Figure S1. XRD patterns of ZIF-67-US and ZIF-67 recorded for 2θ = 5–80°.



Figure S2. TG curve of synthesized ZIF-67-US

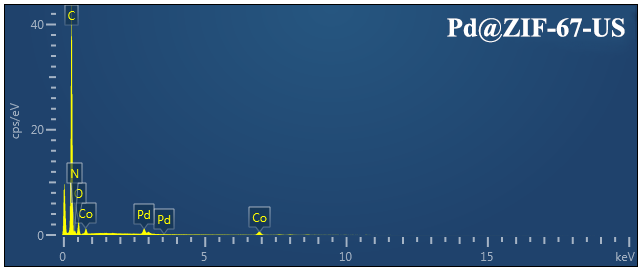
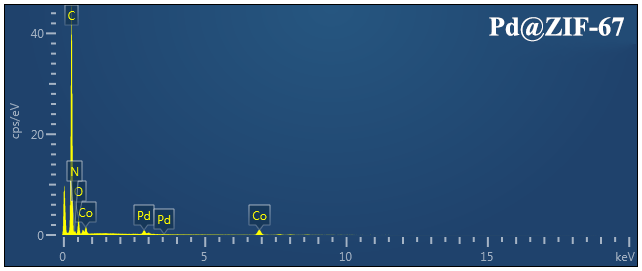


Figure S3. EDS spectrum of Pd@ZIF-67-US and Pd@ZIF-67-US



Figure S4. Nitrogen adsorption isotherms of synthesized products



Figure S5. Pore Diameter distribution of ZIF-67, ZIF-67-US, Pd@ZIF-67 and US Pd@ZIF-67



Figure S6. Yield comparison between o/m/p-chloronitrobenzene. Reaction conditions: reactant (2 mmol), DMF (20 mL), US treated catalyst (20 mg), HCOOH (500 μL), 60 °C.

Figure S7. Recycling experiment: reactant (2,6-dinitrotoluene, 2 mmol), DMF (20 mL), recycled Pd@ZIF-67-US (20 mg), HCOOH (500 μL), 60 °C, reaction time of 2 h.

Table S1. BET surface areas of synthesis compounds

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ZIF-67 | ZIF-67-US | Pd@ZIF | US Pd@ZIF |
| BET Surface Area (m²/g): | 1093.02 | 1165.11 | 107.13 | 123.55 |
| t-Plot External Surface Area (m²/g): | 7.55 | 27.43 | 15.15 | 24.75 |
| t-Plot micropore volume (cm³/g): | 0.56 | 0.59 | 0.05 | 0.05 |