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**Sonochemical synthesis of $Fe_3O_4@NH_2$ -mesoporous silica@Polypyrrole/Pd:
a core/double shell nanocomposite for catalytic applications**

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Highlights

- Magnetic Fe_3O_4 nanoparticles were sonochemically synthesized
- The coating of Fe_3O_4 nanoparticles with mesoporous silica was sonochemically assisted
- 1 hour sonopolymerization was sufficient to coat PPy/Pd on Fe_3O_4 /amintaed silica core/shell structures.
- A core/double layer shell nanocomposite has been obtained
- The ternary nanocomposite showed high catalytic performances

Graphical abstract

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