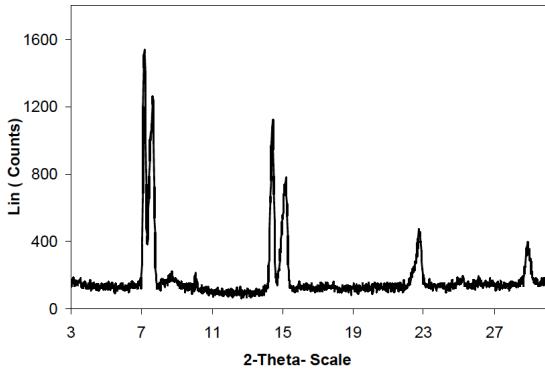
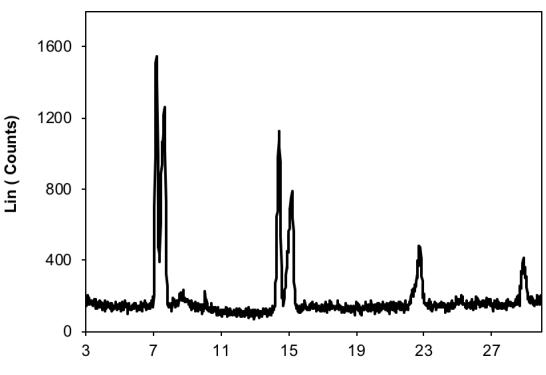
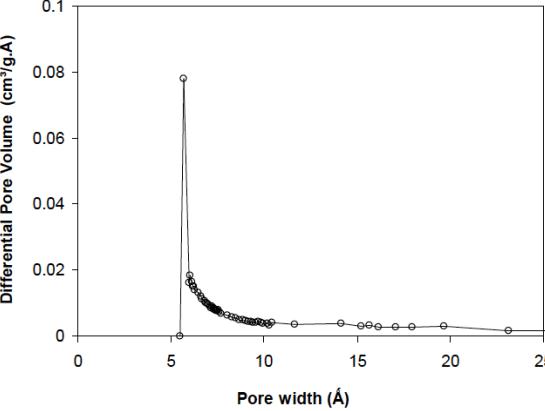
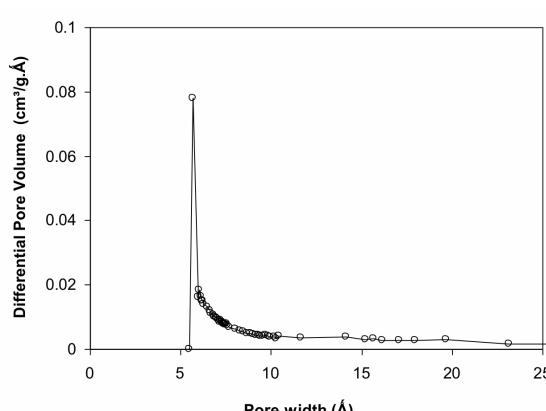
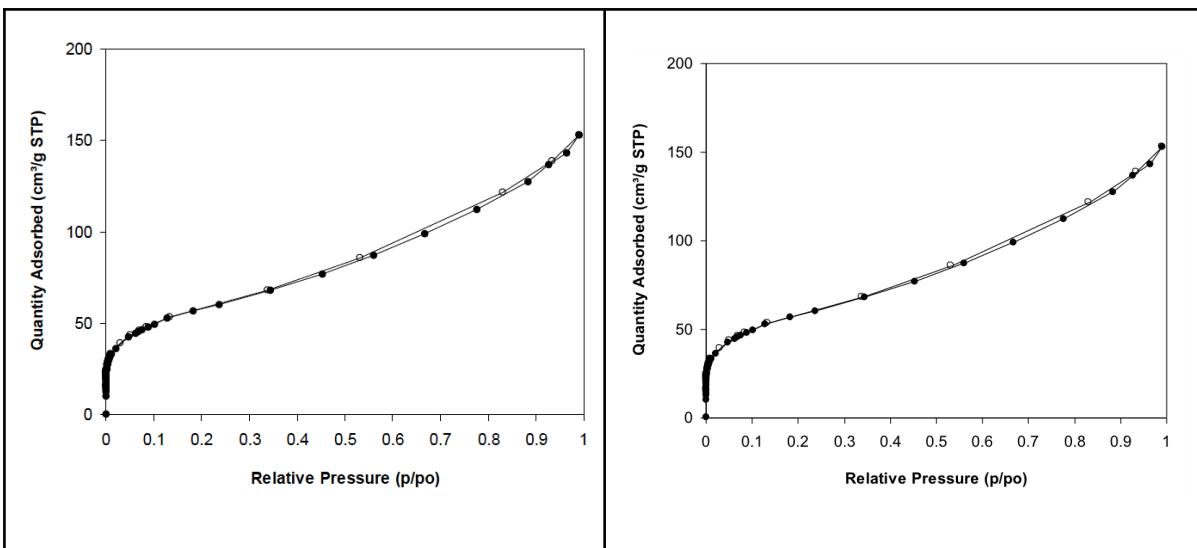


This document presents similarities between many figures of several papers from Phan's lab. Further information is available from the corresponding journals by clicking on the links.

<p>Cross-dehydrogenative coupling of coumarins with Csp³-H bonds using an iron-organic framework as a productive heterogeneous catalyst <i>RSC Adv.</i>, 2018, 8, 10736. https://pubs.rsc.org/en/content/articlehtml/2018/r/a/c8ra00872h</p>	<p>A new route to triphenylpyridines utilizing ketoximes as building blocks via cascade reactions under iron-organic framework catalysis <i>Applied Organomet. Chem.</i> 2019, 33, e4841 https://onlinelibrary.wiley.com/doi/abs/10.1002/oc.4841</p>
 <p>Fig. S1. X-ray powder diffractograms of the VNU-20.</p>	 <p>Fig. S1. X-ray powder diffractogram of the VNU-20.</p>
<p>page 3, SI</p>  <p>Fig. S4. Pore size distribution of the VNU-20.</p>	<p>page 4, SI</p>  <p>Fig. S4. Pore size distribution of the VNU-20.</p>



2.1. Synthesis of metal-organic framework VNU-20

In a typical synthesis, 1,3,5-benzenetricarboxylic acid (H_3BTC ; 0.03 g, 0.112 mmol), 2,6-naphthalenedicarboxylic acid (H_2NDC ; 0.09 g, 0.42 mmol), and $FeCl_2$ (0.09 g, 0.705 mmol) were dissolved in *N,N*-dimethylformamide (DMF; 12 mL). The mixture was then sonicated for 5 min to achieve a clear solution. This solution was subsequently divided into glass tubes, which was sealed and placed in an isothermal oven at 200 °C for 72 h. Reddish crystals of VNU-20 were formed during the experiment. Consequently, VNU-20 crystals were washed by DMF (5 × 15 mL) and methanol (5 × 15 mL). The sample was then activated under a dynamic vacuum to obtain activated VNU-20 (0.057 g; 75% yield based on H_3BTC).

Synthesis of metal-organic framework VNU-20

In order to synthesize VNU-20, $FeCl_2$ (0.09 g, 0.705 mmol), 1,3,5-benzenetricarboxylic acid (H_3BTC ; 0.03 g, 0.112 mmol), and 2,6-naphthalenedicarboxylic acid (H_2NDC ; 0.09 g, 0.42 mmol) were added to a conical flask. *N,N*-Dimethylformamide (DMF; 12 mL) was then introduced to the flask. The mixture was subsequently treated in an ultrasound bath for 5 min to obtain a transparent solution prior to dividing into glass tubes. These tubes were carefully sealed and heated in an isothermal oven at 200 °C for 72 h. The obtained crystals of VNU-20 were washed with DMF (5 × 15 mL) and methanol (5 × 15 mL) following by the activation under a dynamic vacuum to achieve activated VNU-20 (0.053 g; 71% yield based on H_3BTC).

Synthesis of α-acyloxy ethers via direct esterification of carboxylic acids with ethers under metal-organic framework catalysis
<https://www.sciencedirect.com/science/article/pii/S0040402017308761>
Tetrahedron **2017**, 73, 5883

A new pathway to 2-arylbenzoxazoles and 2-arylbenzothiazoles via one-pot oxidative cyclization reactions under iron-organic framework catalysis
<https://link.springer.com/article/10.1007/s10562-019-02747-1>
Catalysis Letters, **2019**, 149, 2035

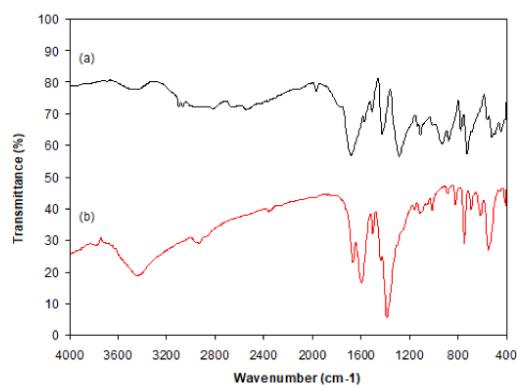


Fig. S7. FT-IR spectra of 1,4-benzenedicarboxylic acid (a), and MOF-235 (b).

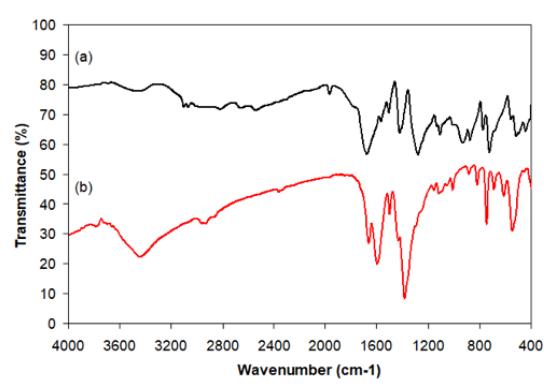
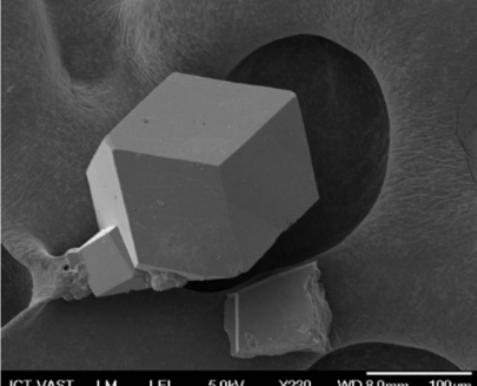
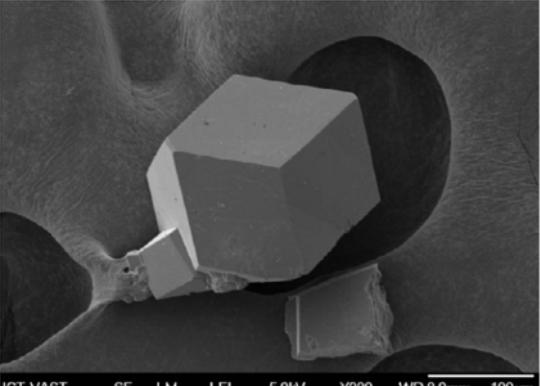


Fig. S7. FT-IR spectra of biphenyl-4,4'-dicarboxylic acid (a), and the MOF-235 (b).

<p>2.1. Synthesis of metal–organic framework VNU-20</p> <p>In a typical synthesis, 1,3,5-benzenetricarboxylic acid (H_3BTC; 0.03 g, 0.112 mmol), 2,6-naphthalenedicarboxylic acid (H_2NDC; 0.09 g, 0.42 mmol), and $FeCl_2$ (0.09 g, 0.705 mmol) were dissolved in N,N-dimethylformamide (DMF; 12 mL). The mixture was then sonicated for 5 min to achieve a clear solution. This solution was subsequently divided into glass tubes, which was sealed and placed in an isothermal oven at 200 °C for 72 h. Reddish crystals of VNU-20 were formed during the experiment. Consequently, VNU-20 crystals were washed by DMF (5 × 15 mL) and methanol (5 × 15 mL). The sample was then activated under a dynamic vacuum to obtain activated VNU-20 (0.057 g; 75% yield base on H_3BTC).</p>	<p>Synthesis of metal-organic framework VNU-20</p> <p>In order to synthesize VNU-20, $FeCl_2$ (0.09 g, 0.705 mmol), 1,3,5-benzenetricarboxylic acid (H_3BTC; 0.03 g, 0.112 mmol), and 2,6-naphthalenedicarboxylic acid (H_2NDC; 0.09 g, 0.42 mmol) were added to a conical flask. N,N-Dimethylformamide (DMF; 12 mL) was then introduced to the flask. The mixture was subsequently treated in an ultrasound bath for 5 min to obtain a transparent solution prior to dividing into glass tubes. These tubes were carefully sealed and heated in an isothermal oven at 200 °C for 72 h. The obtained crystals of VNU-20 were washed with DMF (5 × 15 mL) and methanol (5 × 15 mL) following by the activation under a dynamic vacuum to achieve activated VNU-20 (0.053 g; 71% yield based on H_3BTC).</p>
<p>Friedel-crafts alkylation of anisole and benzyl bromide using zif-8 as an efficient catalyst http://stdj.scienceandtechnology.com.vn/index.php/stdj/article/view/2010 <i>Sci. Technol. Dev. J.</i> 2011, 14, 74</p>	<p>A Zeolite Imidazolate Framework ZIF-8 Catalyst for Friedel-Crafts Acylation https://www.sciencedirect.com/science/article/abs/pii/S1872206711603689 <i>Chinese J. Catal.</i> 2012, 33, 688</p>
 <p>ICT-VAST LM LEI 5.0kV X230 WD 8.0mm 100μm</p> <p>Figure 2. SEM (left), micrographs of the ZIF-8. Trang 76</p>	 <p>ICT-VAST SE LM LEI 5.0kV X230 WD 8.0mm 100μm</p> <p>Fig. 2. SEM image of the ZIF-8.</p>

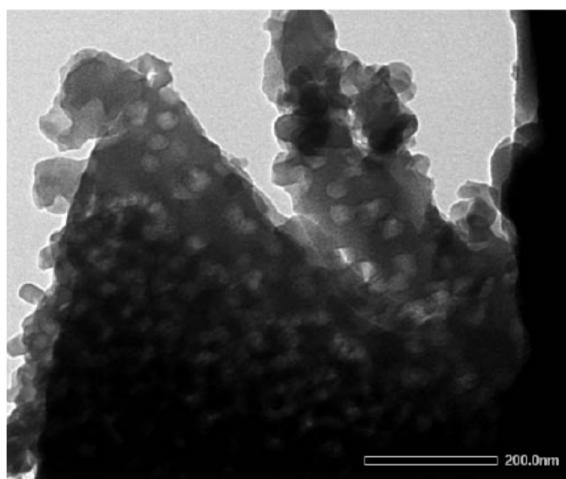


Figure 2. TEM (right), micrographs of the ZIF-8
Trang 76

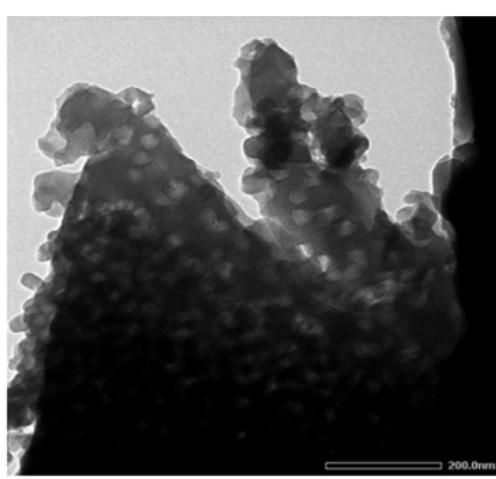


Fig. 3. TEM image of the ZIF-8.

and in graphical abstract

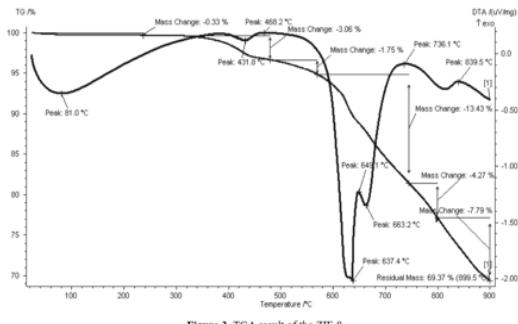


Figure 3. TGA result of the ZIF-8

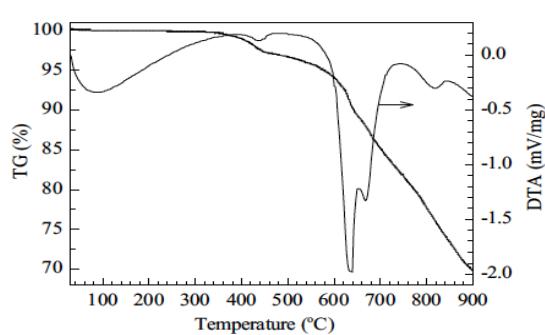


Fig. 6. TGA analysis of the ZIF-8.

2.2. Synthesis of ZIF-8

In a typical preparation, a solid mixture of zinc nitrate hexahydrate ($\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$) (1.88 g, 6.33mmol) and 2-methylimidazole (H-MeIM) (0.43g, 5.82mmol) was dissolved in 130 ml of N,N'-dimethylformamide (DMF) in a 10 x 20 ml vials. The vial was tightly capped and heated at a rate of 5 oC/min to 140 oC in a programmable oven and held at this temperature for 24 h, then cooled at a rate of 0.4 oC/min to room temperature. After removal of mother liquor from the mixture, chloroform (20 ml) was added to the vial. Colorless polyhedral crystals were collected from the upper chloroform layer, washed with DMF (3 x 15 ml) for 3 days. After that, the DMF was exchanged by dichloromethane (DCM) (3 x 15 ml) for 3 days. The residual solvents were removed under vacuum at 200 oC for 6h, yielding 0.26 g of white polyhedral crystals (23% based on 2-methylimidazole).

1.2 Synthesis of ZIF-8

In a typical preparation [43], a solid mixture of zinc nitrate hexahydrate ($\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$, 3.76 g, 14.7 mmol) and 2-methylimidazole (H-MeIM, 0.43 g, 11.6 mmol) was dissolved in 240 ml of N,N'-dimethylformamide (DMF) that was then distributed into 20 ml vials. The vial was tightly capped and heated at a rate of 5 oC/min to 140 oC in a programmable oven and held at this temperature for 24 h, then cooled at a rate of 0.4 oC/min to room temperature. After removal of the mother liquor from the mixture, chloroform (20 ml) was added to the vials. Colorless polyhedral crystals were collected from the upper chloroform layer and soaked in DMF (3 15 ml) for 3 d. After that, the DMF was exchanged for dichloromethane (DCM) (3 15 ml) for 3 d. The residual solvent was removed by vacuum at 200 oC for 6 h, which yielded 0.30 g of white polyhedral crystals (25% yield based on 2-methylimidazole).

Friedel-crafts alkylation of anisole and benzyl bromide using zif-8 as an efficient catalyst
<http://stdj.scienceandtechnology.com.vn/index.php/stdj/article/view/2010>

Sci. Technol. Dev. J. **2011**, *14*, 74

Expanding applications of metal-organic frameworks: zeolite imidazolate framework zif-8 as an efficient heterogeneous catalyst for the knoevenagel reaction
<https://pubs.acs.org/doi/10.1021/cs1000625>
ACS Catal. **2011**, *1*, 120

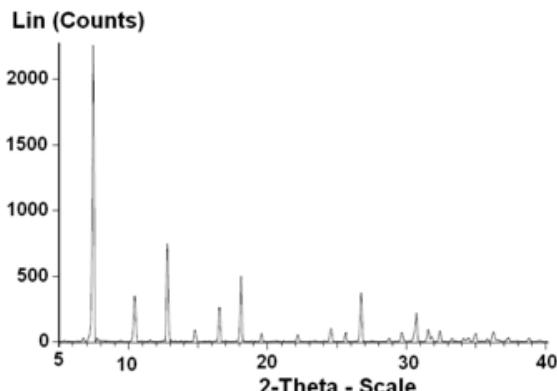


Figure 1. X-ray powder diffractogram of the ZIF-8

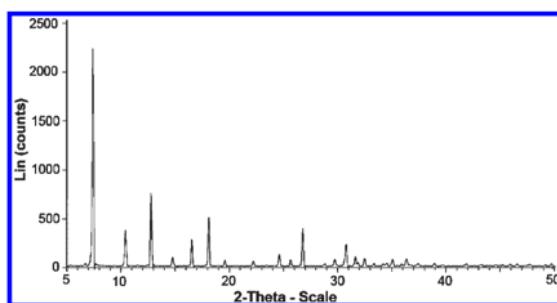


Figure 3. X-ray powder diffractogram of the ZIF-8.

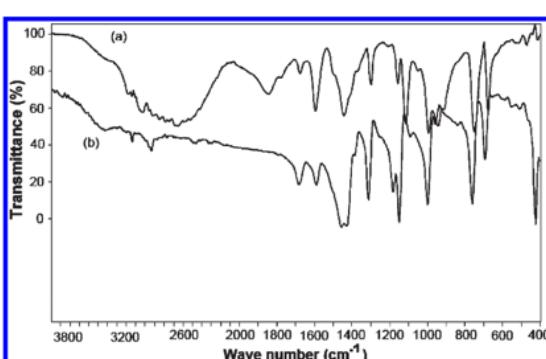


Figure 6. FT-IR spectra of 2-methylimidazole (a) and the ZIF-8 (b).

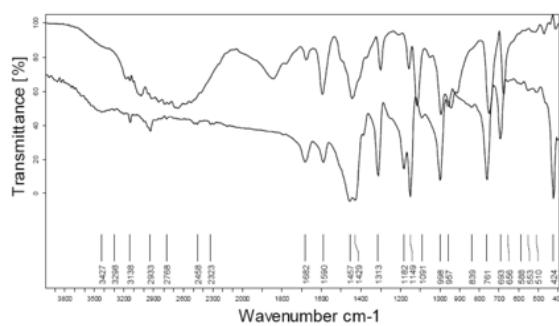


Figure 4. FT-IR spectra of the 2-methylimidazole linker (above) and the ZIF-8 (below)

2.2. Synthesis of ZIF-8

In a typical preparation, a solid mixture of zinc nitrate hexahydrate ($Zn(NO_3)_2 \cdot 6H_2O$) (1.88 g, 6.33mmol) and 2-methylimidazole (H-MeIM) (0.43g, 5.82mmol) was dissolved in 130 ml of N,N'-dimethylformamide (DMF) in a 10 x 20 ml vials. The vial was tightly capped and heated at a rate of 5 oC/min to 140 oC in a programmable oven and held at this temperature for 24 h, then cooled at a rate of 0.4 oC/min to room temperature. After removal of mother liquor from the mixture, chloroform (20 ml) was added to the vial. Colorless polyhedral crystals were collected from the upper chloroform layer, washed with DMF (3 x 15 ml) for 3 days. After that, the DMF was exchanged by dichloromethane (DCM) (3 x 15 ml) for 3 days. The residual solvents were removed under vacuum at 200 oC for 6h, yielding 0.26 g of white polyhedral crystals (23% based on 2-methylimidazole).

2.2. Synthesis of ZIF-8.

In a typical preparation, a solid mixture of zinc nitrate hexahydrate ($Zn(NO_3)_2 \cdot 6H_2O$) (1.88 g, 6.33 mmol) and 2-methylimidazole (H-MeIM) (0.43 g, 5.82 mmol) was dissolved in 130 mL of N,N'-dimethylformamide (DMF), then distributed in 20 mL vials. The vial was tightly capped and heated at a rate of 5 C/min to 140 C in a programmable oven and held at this temperature for 24 h, then cooled at a rate of 0.4 C/min to room temperature. After removal of mother liquor from the mixture, chloroform (20 mL) was added to the vial. Colorless polyhedral crystals were collected from the upper chloroform layer, washed with DMF (3 15 mL) for 3 days. After that, the DMF was exchanged by dichloromethane (DCM) (3 15 mL) for 3 days. The residual solvents were removed under vacuum at 200 C for 6 h, yielding 0.26 g of white

	polyhedral crystals (23% based on 2-methylimidazole).
Towards applications of metal–organic frameworks in catalysis: c–h direct activation of benzoxazole with aryl boronic acids using ni₂(bdc)₂(dabco) as an efficient heterogeneous catalyst <i>Catal. Sci. Technol.</i> , 2014, 4, 369-377	Nickel-catalyzed oxidative coupling of alkynes and aryl boronic acids using metalorganic framework ni₂(bdc)₂(dabco) as an efficient heterogeneous catalyst <i>Catal. Sci. Technol.</i> , 2014, 4, 1276-1285
<p>Fig. S2. SEM micrograph of the Ni₂(BDC)₂(DABCO).</p>	<p>Fig. S2. SEM micrograph of the Ni₂(BDC)₂(DABCO).</p>
<p>Fig. S4. Pore size distribution of the Ni₂(BDC)₂(DABCO).</p>	<p>Fig. S4. Pore size distribution of the fresh Ni₂(BDC)₂(DABCO).</p>

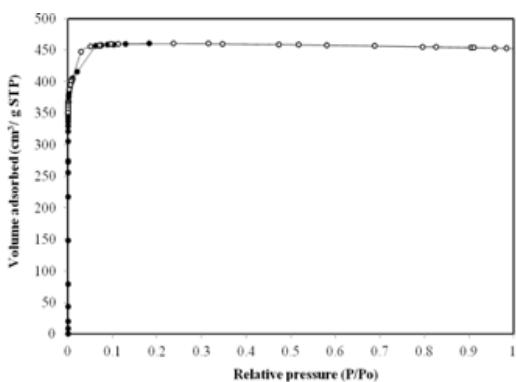


Fig. S5. Nitrogen adsorption/desorption isotherm of the $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$. Adsorption data are shown as closed circles and desorption data as open circles.

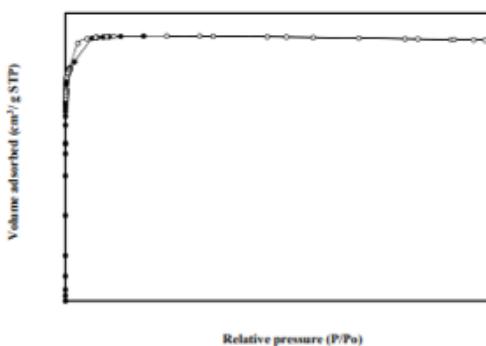


Fig. S5. Nitrogen adsorption/desorption isotherm of the $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$. Adsorption data are shown as closed circles and desorption data as open circles.

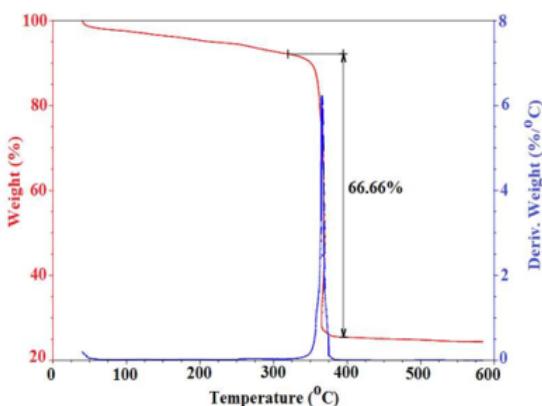


Fig. S6. TGA analysis of the $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$.

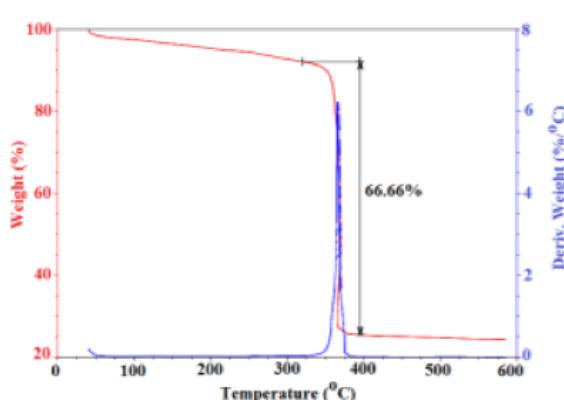


Fig. S6. TGA analysis of the $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$.

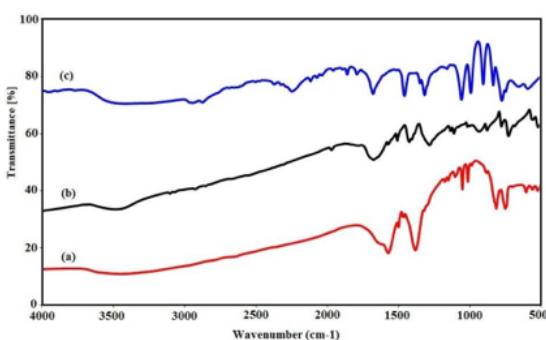


Fig. S7. FT-IR spectra of the $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$ (a), 1,4-benzenedicarboxylic acid (b), and 1,4-diazabicyclo[2.2.2]octane (c).

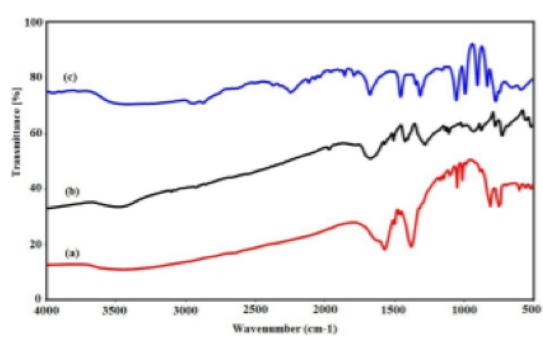


Fig. S7. FT-IR spectra of the $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$ (a), 1,4-benzenedicarboxylic acid (b), and 1,4-diazabicyclo[2.2.2]octane (c).

2.2. Synthesis of the metal–organic framework $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$

In a typical preparation, a solid mixture of H₂BDC (H₂BDC = 1,4-benzenedicarboxylic acid; 0.332 g, 2 mmol), DABCO (DABCO = 1,4-diazabicyclo[2.2.2]octane; 0.112 g, 1 mmol), and Ni(NO₃)₂·6H₂O (0.58 g, 2 mmol) was dissolved in DMF (DMF = N,N'-dimethylformamide; 15 ml). The resulting solution was distributed among two 20 ml vials. The vials were then heated at 100 °C in an isothermal oven for 48 h. After cooling the vials

2.2. Synthesis of the metal–organic framework $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$

In a typical preparation, a solid mixture of H₂BDC (H₂BDC = 1,4-benzenedicarboxylic acid; 0.415 g, 2.5 mmol), DABCO (DABCO = 1,4-diazabicyclo[2.2.2]octane; 0.168 g, 1.5 mmol), and Ni(NO₃)₂·6H₂O (0.58 g, 2 mmol) was dissolved in DMF (DMF = N,N'-dimethylformamide; 15 ml). The resulting solution was distributed to two 20 ml vials. The vials were then heated at 100 °C in an isothermal oven for 48 h. After cooling the vials

to room temperature, the solid product was removed by decanting with the mother liquor and washed in DMF (3×10 ml) for 3 days. Solvent exchange was carried out with methanol (3×10 ml) at room temperature for 3 days. The material was then evacuated under vacuum at 140°C for 6 h, yielding 0.385 g of Ni₂(BDC)₂(DABCO) in the form of green crystals (69% yield).

to room temperature, the solid product was removed by decanting with mother liquor and washed in DMF (3×10 ml) for 3 days. Solvent exchange was carried out with methanol (3×10 ml) at room temperature for 3 days. The material was then evacuated under vacuum at 140°C for 6 h, yielding 0.425 g of Ni₂(BDC)₂(DABCO) in the form of green crystals (76% yield).

Although both papers report on the use of their synthesized catalyst for the synthesis of known products via known reactions, no copy of NMR spectra was reported for both papers, at least to make sure that the products were really obtained with reasonable purity. The two papers even lacked the spectral description of the obtained products.

Copper Ferrite Superparamagnetic Nanoparticles as a Heterogeneous Catalyst for Directed Phenol/Formamide Coupling
<https://www.sciencedirect.com/science/article/pii/S0040403917309048>

Synthesis of triphenylamines via ligand-free selective ring-opening of benzoxazoles or benzothiazoles under superparamagnetic nanoparticle catalysis
<https://pubs.rsc.org/en/content/articlehtml/2017/r/a/c7ra06168d>

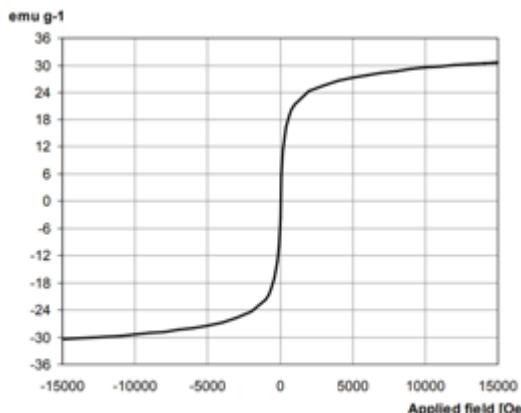


Fig. S4. Magnetization curves for the CuFe₂O₄ catalyst measured at room temperature.

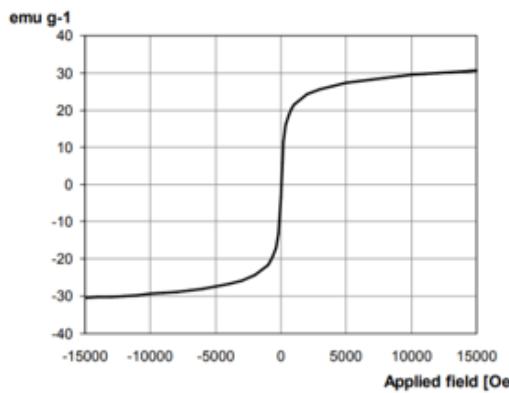


Fig. S4. Magnetization curves for the CuFe₂O₄ catalyst measured at room temperature.

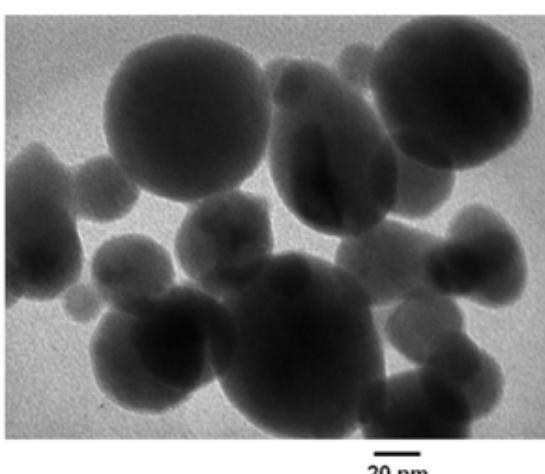


Fig. S3. TEM micrograph of the CuFe₂O₄ catalyst.

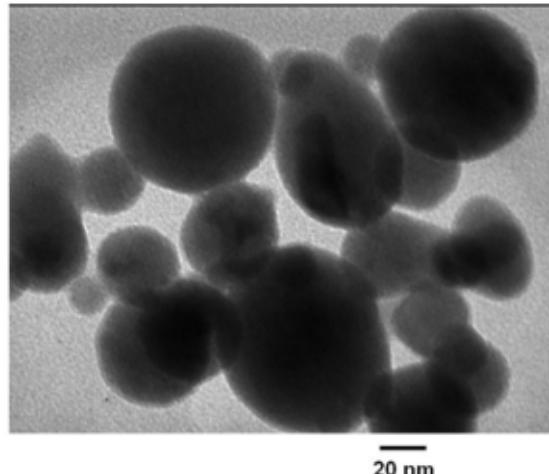


Fig. S3. TEM micrograph of the CuFe₂O₄ catalyst.

Copper Ferrite Superparamagnetic Nanoparticles as a Heterogeneous Catalyst for Directed Phenol/Formamide Coupling
<https://www.sciencedirect.com/science/article/abs/pii/S0040403917309048>
Tetrahedron Lett. **2017**, *58*, 3370

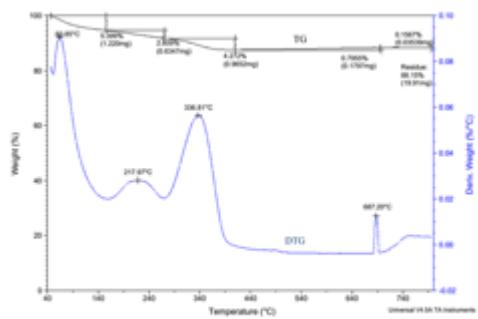


Figure S7. TGA result of the CuFe₂O₄ catalyst.

Superparamagnetic nanoparticles as a recyclable catalyst: A new access to phenol esters via cross dehydrogenative coupling reactions
<https://pubs.rsc.org/en/content/articlelanding/2017/ra/c7ra11706#!divAbstract>
RSC Adv., **2017**, *7*, 55756-55766

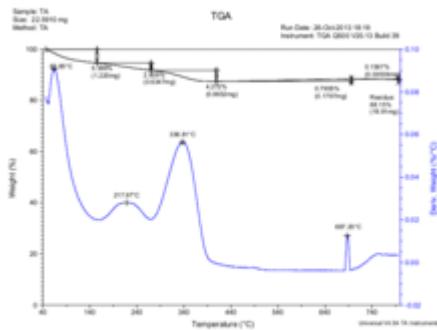


Fig. S5. TGA analysis of the CuFe₂O₄ nanoparticles.

Amidation via ligand-free direct oxidative C(sp³)-H/N-H coupling with Cu-CPO-27 metal-organic framework as a recyclable heterogeneous catalyst
<https://www.sciencedirect.com/science/article/abs/pii/S0040402016311188>
Tetrahedron **2016**, *72*, 8241

A direct strategy to hybrid benzothiazole-carbamate moieties via O-acylation of phenols under metal-organic framework catalysis
<https://pubs.rsc.org/en/content/articlelanding/2017/re/c7re00067g#!divAbstract>
React. Chem. Eng., **2017**, *2*, 669

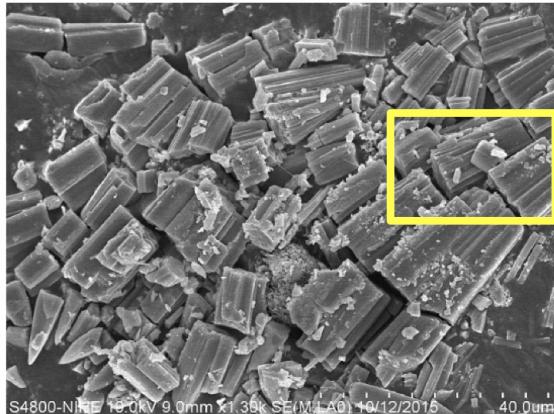


Fig. S2. SEM micrograph of the Cu-CPO-27.

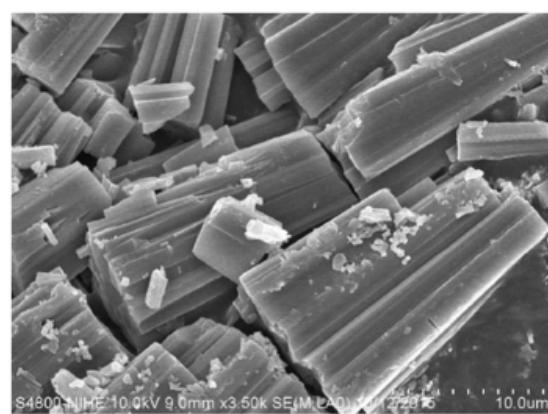
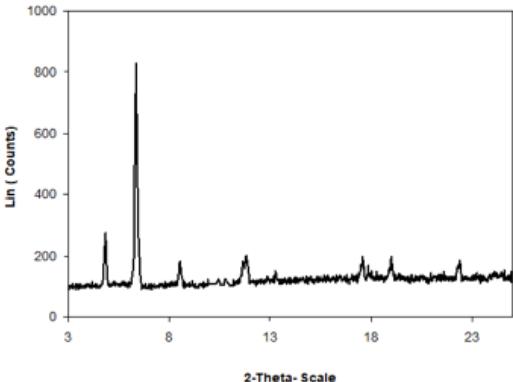
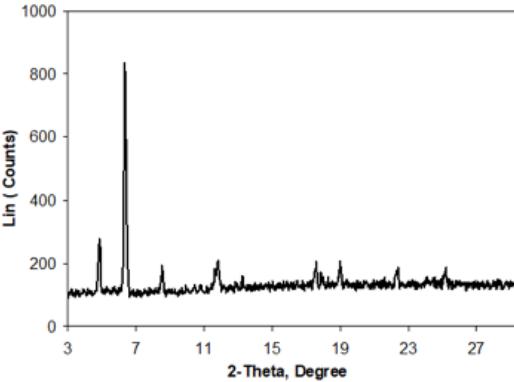


Fig. S2. SEM micrograph of the Cu-CPO-27.

The NMR spectra in this paper [React. Chem. Eng.](https://pubs.rsc.org/en/content/articlelanding/2017/re/c7re00067g#!divAbstract) **2017**, *2*, 669 were exactly the same for figure from S8 to S23 (same numbering) as in [Tetrahedron Letters](https://www.sciencedirect.com/science/article/abs/pii/S0040403917309048). **2017**, *58*, 3370-3373. The physical and spectra description of the obtained compounds were strictly similar, even the yields and external aspects although the

	yields described in the manuscripts are not the same.
<p>4.1. Preparation of the metal-organic framework Cu-CPO-27</p> <p>All reagents and starting materials were obtained commercially from Sigma-Aldrich, Acros, and Merck, and were used as received without any further purification unless otherwise noted. The Cu-CPO-27 was synthesized following a literature procedure.^{63,64} In a typical experiment, H₂dhtp (H₂dhtp = 2,5-dihydroxyterephthalic acid; 0.186 g, 0.97 mmol), and Cu(NO₃)₂·3H₂O (0.500 g, 2.07 mmol) were added to a mixture of DMF (DMF = <i>N,N</i>-dimethylformamide; 20 mL), and water (1 mL). The resulting mixture was magnetically stirred for 10 min to produce a clear solution, and was then equally split between three 10 mL vials. The vials were tightly capped and heated at 85 °C for 18 h to obtain reddish crystals. After cooling the vials to room temperature, the crystals were collected and washed in DMF (3 × 20 mL) for 3 days. The frameworks were then soaked in methanol (3 × 20 mL) at room temperature for 3 days. The framework was then heated on a Schlenk line under vacuum at 150 °C for 5 h, yielding 0.260 g of product as reddish black crystals (60% based on 2,5-dihydroxyterephthalic acid).</p>	<p>2.2. Synthesis of the metal-organic framework Cu-CPO-27</p> <p>In a representative experiment, Cu(NO₃)₂·3H₂O (1.18 g, 4.88 mmol) was added to a conical flask holding H₂dhtp (H₂dhtp = 2,5-dihydroxyterephthalic acid; 0.44 g, 2.29 mmol). A solution of isopropanol in <i>N,N</i>-dimethylformamide (50 ml, 1:16 v/v) was then introduced to the flask. The mixture was magnetically stirred for 15 min at ambient temperature to dissolve the solid completely. The clear solution was then dispensed into seven pressurized vials. The vials were firmly covered, stabilized on a tray, put into an oven, and heated at 85 °C for 18 h. Crystals were generated on the vial wall during the course of the heating. Subsequent to this step, the vials were cooled down to ambient temperature. The crystals were collected by decantation and washed with <i>N,N</i>-dimethylformamide (3 × 10 mL). The product was subsequently submerged in isopropanol (3 × 10 mL) at ambient temperature to replace the non-volatile <i>N,N</i>-dimethylformamide with isopropanol. The framework was then dried under vacuum at 150 °C for 6 h on a Schlenk line, producing 0.62 g of Cu-CPO-27 as reddish black crystals (60% yield with respect to 2,5-dihydroxyterephthalic acid).</p>
<p>Direct C-N coupling of azoles with ethers via oxidative C-H activation under metal-organic framework catalysis https://www.sciencedirect.com/science/article/abs/pii/S1226086X16302891 <i>J. Ind. Eng. Chem.</i> 2016, <i>44</i>, 136</p>	<p>Synthesis of aryl-substituted pyridines via cyclization of N,N-dialkylanilines with ketoxime carboxylates under metal-organic framework catalysis https://www.sciencedirect.com/science/article/abs/pii/S1226086X17302654 <i>J. Ind. Eng. Chem.</i> 2017, <i>54</i>, 151</p>
 <p>Fig. S1. X-ray powder diffractograms of the Fe₃O(BPDC)₃.</p>	 <p>Fig. S1. X-ray powder diffractograms of the Fe₃O(BPDC)₃.</p>

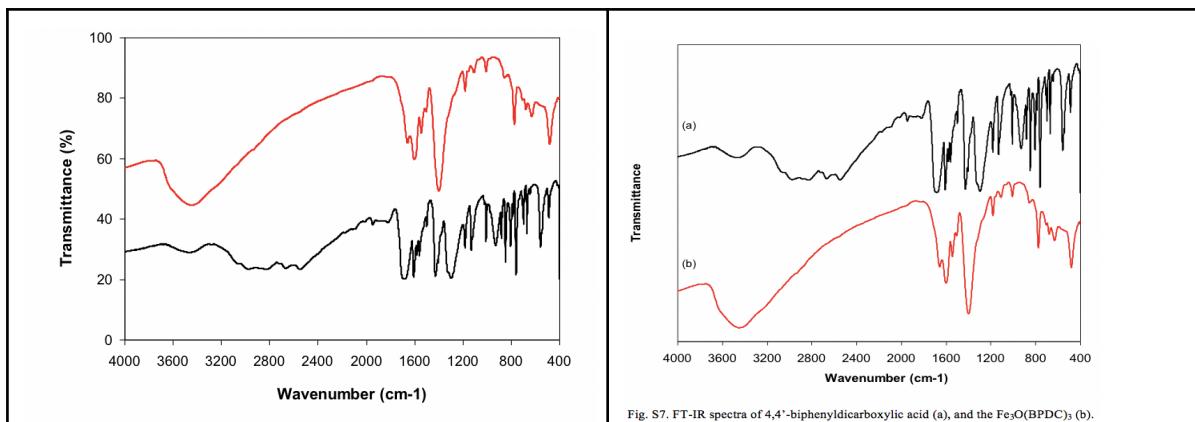


Fig. S7. FT-IR spectra of biphenyl-4,4'-dicarboxylic acid (a), and the Fe₃O(BPDC)₃ (b).

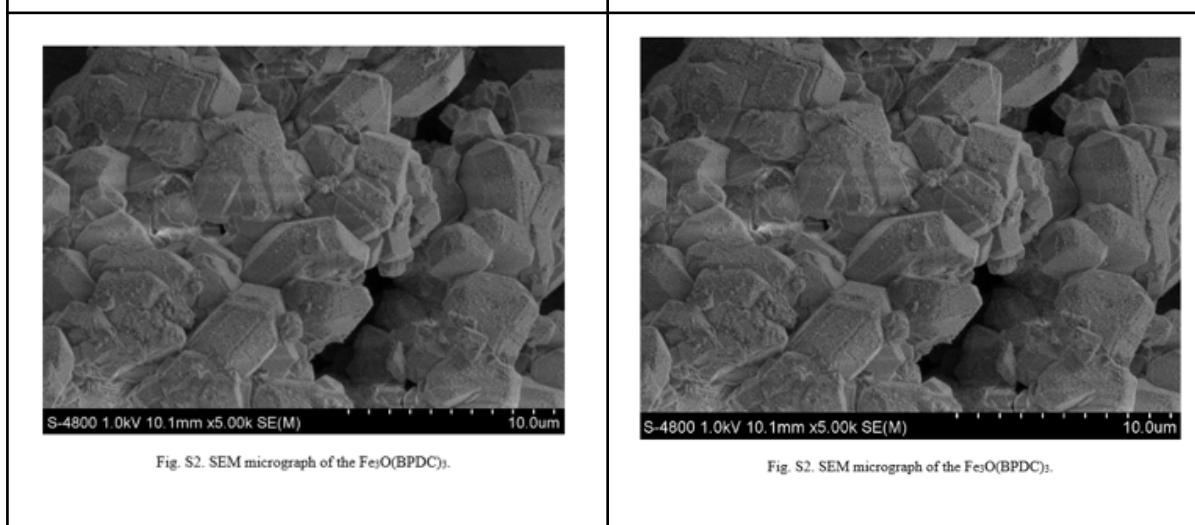


Fig. S2. SEM micrograph of the Fe₃O(BPDC)₃.

Fig. S2. SEM micrograph of the Fe₃O(BPDC)₃.

Synthesis of the metal–organic framework Fe₃O(BPDC)₃

The catalyst was synthesized in compliance with a marginally modified literature method [44]. In a standard preparation, a mixture of acetic acid (CH₃COOH; 0.4 mL, 7 mmol) and H₂BPDC (H₂BPDC = biphenyl-4,4'-dicarboxylic acid; 0.08 g, 0.33 mmol) was added to DMF (DMF = N,N'-dimethylformamide; 30 mL). FeCl₃·6H₂O (0.1667 g, 0.62 mmol) was dissolved in DMF (10 mL), and the resulting solution was then added dropwise to the solution of acetic acid and H₂BPDC. The mixture was magnetically stirred for 1 h to accomplish a transparent solution. This solution was then delivered in four 20-mL vials. The vials were heated at 120 °C in an oven for 48 h. After this period, the vials were cooled down to room temperature, and the crystals were isolated by decantation. The Fe-MOF was washed with DMF (3 × 10 mL), and immersed in dichloromethane (3 × 10 mL) at room temperature. The product was then dried at 140 °C for 6 h under vacuum in a Shlenkline, providing 0.0762 g of the Fe₃O(BPDC)₃ in the form of light orange crystals (76% based on biphenyl-4,4'-dicarboxylic acid).

Catalyst synthesis

The Fe₃O(BPDC)₃ was synthesized via solvothermal method. In a representative preparation, FeCl₃·6H₂O (0.333 g, 1.24 mmol) in N,N'-dimethylformamide (20 ml) was added to the first beaker. A mixture of H₂BPDC (H₂BPDC = 4,4'-biphenyldicarboxylic acid; 0.16 g, 0.66 mmol) and acetic acid (CH₃COOH, 0.8 ml, 14 mmol) in N,N'-dimethylformamide (20 ml) was added to the second beaker. The former beaker was then poured into the latter along with N,N'-dimethylformamide (40 ml). The resulting mixture was vigorously stirred to achieve a clear solution. The solution was then equally added to pressurized vials. The vials were carefully capped and heated at 120 °C without interruption for 24 h. Orange crystals were produced on the wall of the vials throughout the time of the experiment. Subsequent to this period, the vials were cooled down to ambient temperature. The crystals were collected by decantation, and washed thoroughly with N,N'-dimethylformamide (3 × 20 ml). The solid was then immersed in dichloromethane (3 × 20 ml) at ambient temperature for solvent exchange. Afterwards, the product was dried at 160 °C under vacuum on a Shlenkline for 6 h, obtaining 0.147 g of Fe₃O(BPDC)₃ in the shape of orange crystals (73% yield regarding 4,4'-biphenyldicarboxylic acid). Elemental analysis by ICP indicated that the Fe content in Fe₃O(BPDC)₃ was 17 wt.%.

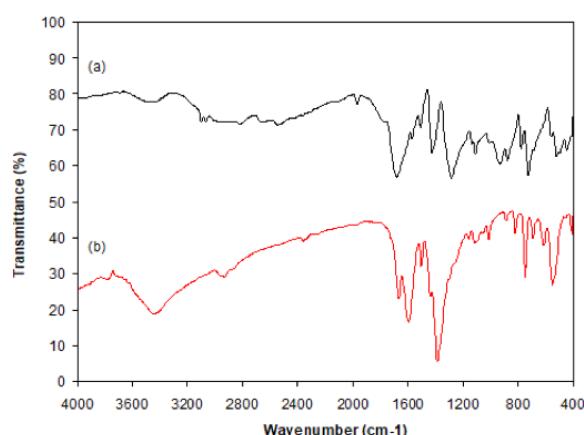


Fig. S7. FT-IR spectra of 1,4-benzenedicarboxylic acid (a), and MOF-235 (b).

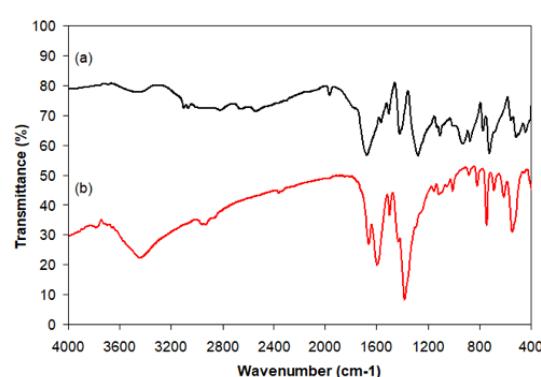


Fig. S7. FT-IR spectra of biphenyl-4,4'-dicarboxylic acid (a), and the MOF-235 (b).

2.1. Catalyst characterization

The MOF-235 was produced in 60% yield, utilizing 1,4-benzenedicarboxylic acid as the linker, and iron (III) chloride hexahydrate as the metal precursor, according to literature procedure.^{41,42} Subsequent to the activation step, the framework was characterized by using standard analysis methods (see Supporting information). XRD observation showed that a crystalline material was attained, with a dramatically sharp peak at 2θ of 9.5° being noted (Fig. S1). As anticipated, the SEM micrograph confirmed that the framework was crystalline (Fig. S2). The TEM image implied that a porous structure was generated, although its pore conformation was ornate (Fig. S3). Pore size distribution analysis displayed that the framework was in microporous range (diameter < 20 Å) (Fig. S4). Langmuir surface areas of 774 m²/g were obtained for the iron-organic framework, being appropriate for catalysis application (Fig. S5). A appreciable weight-loss value of relatively 15% was recorded in the TGA result when the temperature was boosted to 340 °C, describing the thermal stability of the framework (Fig. S6). FT-IR observation of the MOF-235 was different from that of the 1,4-benzenedicarboxylic acid linker, verifying the deprotonation of acid linker caused by the interaction with iron cations (Fig. S7).

2.1 Catalyst Synthesis

The MOF-235 was prepared by utilizing a literature approach [40–42]. In a representative experiment, H₂BDC (H₂BDC = 1,4-benzenedicarboxylic acid; 0.332 g, 2.0 mmol) and FeCl₃·6H₂O (0.541 g, 2.0 mmol) were dissolved in a mixture of DMF (DMF = N,N'-dimethylformamide; 40 mL) and ethanol (40 mL). The mixture was vigorously stirred to obtain a clear solution, and then equally added to eight 20-mL vials. The vials were carefully capped and consequently heated at 85 °C in an oven for 48 h. Light orange crystals were produced on the wall of the vials during the experiment. After cooling the vial to ambient temperature, the crystals were separated by decantation, and washed thoroughly with DMF (3 × 10 mL). Solvent exchange was consequently conducted with ethanol (3 × 10 mL) at room temperature. The Fe-MOF product was subsequently dried under vacuum at 140 °C for 6 h, obtaining 0.306 g of MOF-235 in the form of brick red crystals (45% based on H₂BDC).

0.306 g of MOF-235 in the form of brick red crystals (45% based on H₂BDC).

Three-Component Coupling of Aldehyde, Alkyne, and Amine via C–H Bond Activation Using Indium-Based Metal–Organic Framework Mil-68(Ind) as a Recyclable Heterogeneous Catalyst

<https://link.springer.com/article/10.1007/s10562-016-1805-7>

Catal. Lett. 2016, 146, 2087

Indium-based metal–organic frameworks as catalysts: synthesis of 2-nitro-3-arylimidazo[1,2-a] pyridines via oxidative amination under air using MIL-68(Ind) as an effective heterogeneous catalyst

<https://pubs.rsc.org/en/Content/ArticleLanding/R/A/2017/C7RA02802D#!divAbstract>

RSC Adv., 2017, 7, 23073–23082

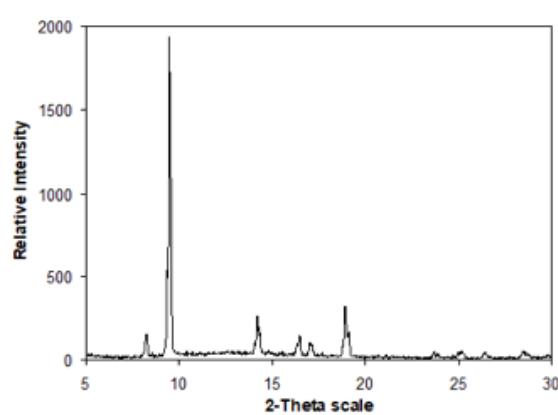


Fig. S1. X-ray powder diffractograms of the MIL-68(In).

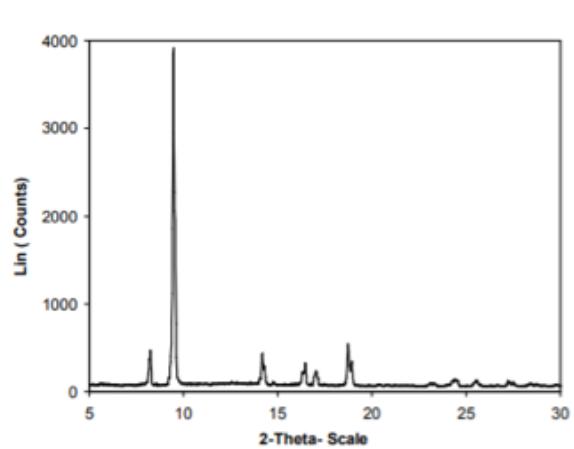


Fig. S1. X-ray powder diffractograms of the MIL-68(In).

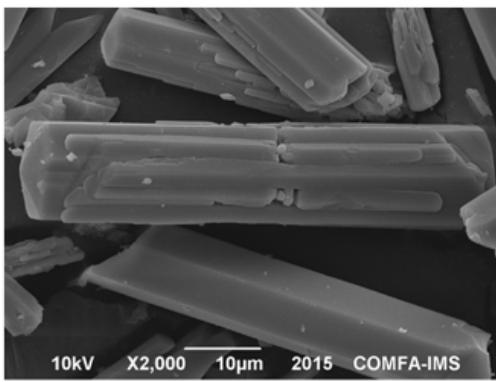


Fig. S2. SEM micrograph of the MIL-68(In).

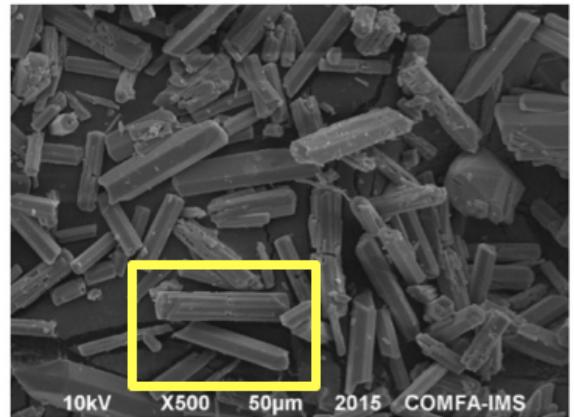


Fig. S2. SEM micrograph of the MIL-68(In).

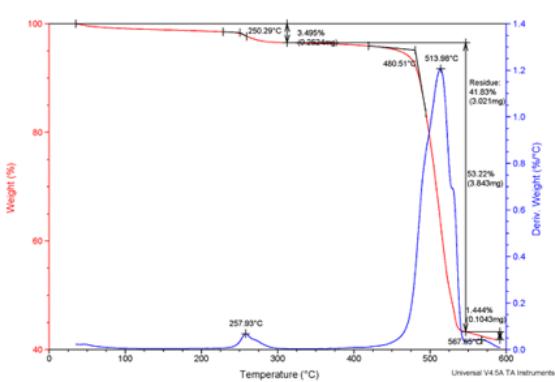


Fig. S6. TGA analysis of the MIL-68(In).

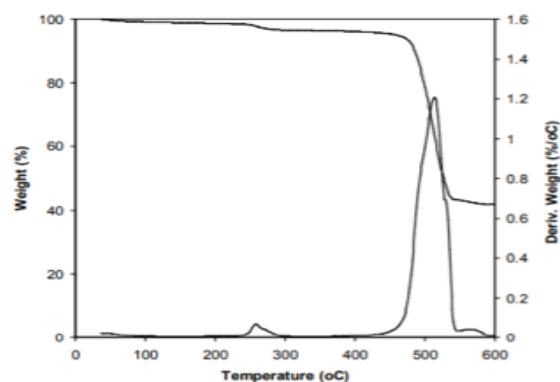
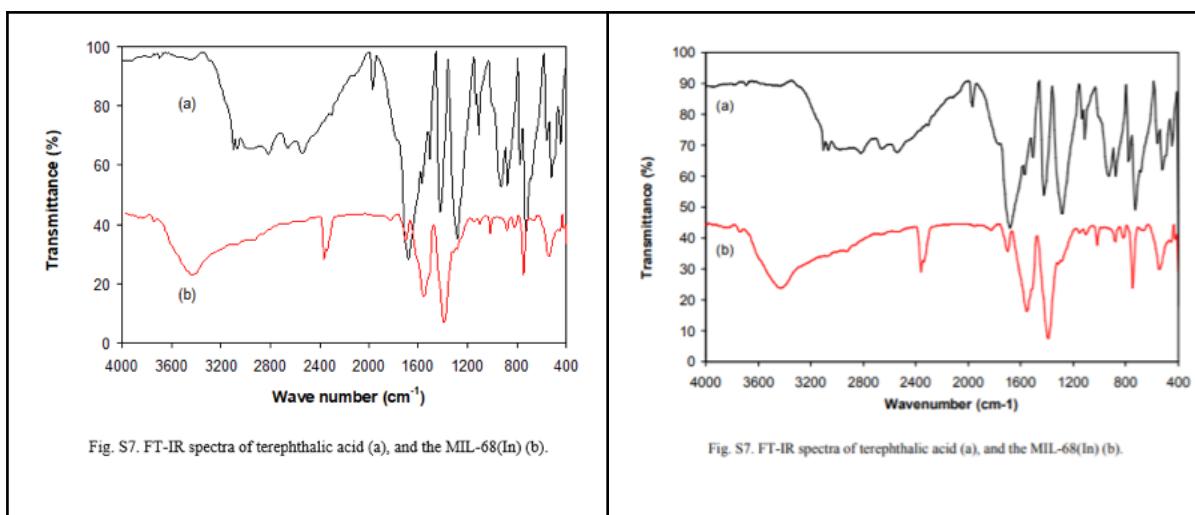


Fig. S6. TGA analysis of the MIL-68(In).



[55]. In the synthesis procedure, H₂BDC (H₂BDC = terephthalic acid; 0.200 g, 1.20 mmol), and In(NO₃)₃.xH₂O (0.408 g, 30 wt% In, 1.05 mmol) were added to DMF (DMF = N,N'-dimethylformamide; 5 mL). The resulting mixture was stirred for 10 min to obtain a clear solution, and was then added to a 8 mL vial. The vial was tightly capped and heated at 100 °C in an oven for 48 h. After unassisted cooling the vial to room temperature, the crystals were collected and washed in DMF (3 × 10 mL) for 3 days. The frameworks were then soaked in DCM (dichloromethane) (3 × 10 mL) at room temperature for 3 days. The product was then heated at 150 °C in a shlenk line under vacuum for 6 h, achieving 0.239 g of white crystal MIL-68(In) (77 % based on indium nitrate). (77 % based on indium nitrate).

2.1. Catalyst synthesis

The MIL-68(In) was prepared from terephthalic acid and indium nitrate by a solvothermal protocol, using a literature procedure formerly published by Latroche *et al.*³² In a representative experiment, In(NO₃)₃.6H₂O (0.408 g, 1.35 mmol) and H₂BDC (H₂BDC = terephthalic acid; 0.200 g, 1.20 mmol) were dissolved in DMF (DMF = N,N'-dimethylformamide; 5 mL). The resulting solution was added to a 10 mL vial. The vial was then covered carefully and heated to 100 °C in an oven for 48 h, generating crystals during the course of the experiment. Following this step, the vial was cooled to room temperature. The frameworks were isolated by decantation and washed in DMF (3 × 10 mL). Solvent interchange was carried out with dichloromethane (3 × 10 mL) at room temperature. The framework was then heated on a Schlenk line under vacuum at 150 °C for 6 h, producing 0.33 g of MIL-68(In) in the form of white crystals (71% based on terephthalic acid). The MIL-68(In) was then characterized by various techniques (see ESI†).

Synthesis of indolizines through aldehyde-amine-alkyne couplings using metal-organic frameworks Cu-MOF-74 as an efficient heterogeneous catalyst
<https://www.sciencedirect.com/science/article/abs/pii/S0021951716000683>
J. Catal. **2016**, 337, 167

Synthesis of 1,2-Dicarbonyl-3-enes by Hydroacylation of 1-Alkynes with Glyoxal Derivatives Using Metal–Organic Framework Cu/MOF-74 as Heterogeneous Catalyst
<https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/cplu.201600075>
Chempluschem **2016**, 81, 361

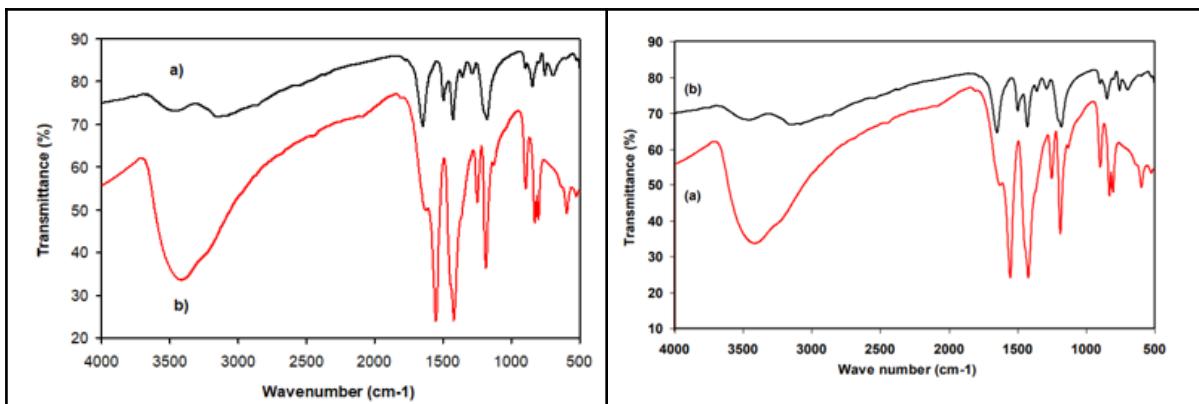


Fig. S7. FT-IR spectra of terephthalic acid (a), and the Cu-MOF-74 (b).

Fig. S7. FT-IR spectra of terephthalic acid (a), and the Cu-MOF-74 (b).

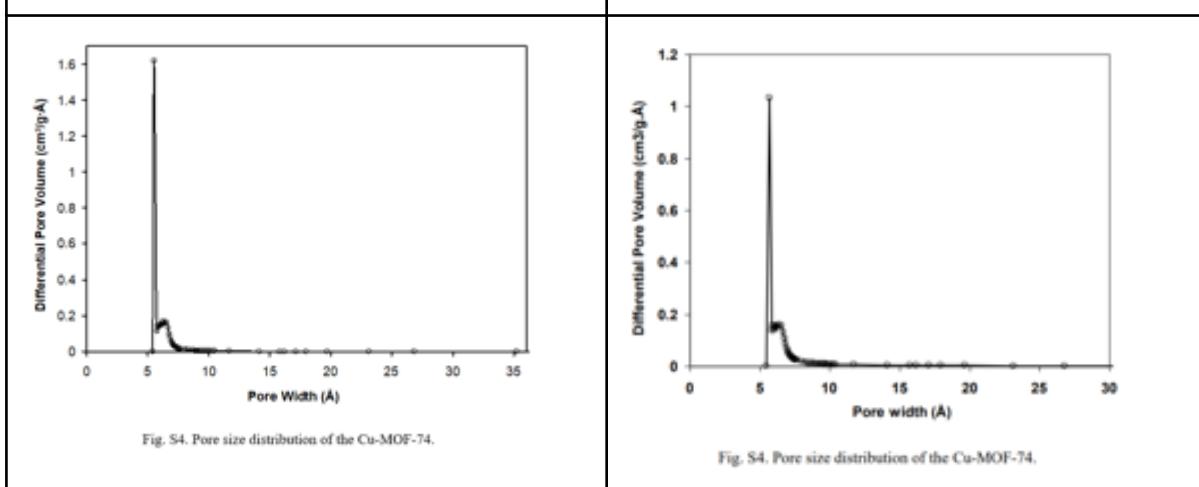


Fig. S4. Pore size distribution of the Cu-MOF-74.

Fig. S4. Pore size distribution of the Cu-MOF-74.

2.2. Synthesis of the metal-organic framework Cu-MOF-74

In a typical preparation, a solid mixture of H₂dhtp (H₂dhtp = 2,5-dihydroxyterephthalic acid; 0.495 g, 2.5 mmol), and Cu(NO₃)₂·3H₂O (1.21 g, 5 mmol) was dissolved in a mixture of DMF (DMF = N,N'-dimethylformamide; 47 mL), and 2-propanol (3 mL). The resulting solution was then distributed to seven 10 mL vials. The vials were heated at 85 °C in an isothermal oven for 18 h. After cooling the vials to room temperature, the solid product was removed by decanting with mother liquor and washed in DMF (3 × 20 mL). Solvent exchange was carried out with 2-propanol (3 × 20 mL) at room temperature. The material was then evacuated under vacuum at 150 °C for 5 h, yielding 0.50 g of Cu-MOF-74, Cu₂(DOBDC), in the form of reddish black crystals (62% yield based on H₂dhtp).

Synthesis of the metal-organic framework Cu/MOF-74

In a typical preparation, a solid mixture of H₂dhtp (H₂dhtp = 2,5-dihydroxyterephthalic acid; 0.440 g, 2.22 mmol), and Cu(NO₃)₂·3H₂O (1.180 g, 4.88 mmol) was dissolved in a mixture of DMF (47 mL) and 2-propanol (3 mL). The suspension was stirred to achieve a homogeneous solution. The resulting solution was then distributed to six 10 mL vials. The vials were then heated at 85 °C in an isothermal oven for 18 h. After cooling the vials to room temperature, the solid product was removed by decanting with mother liquor and washed in DMF (3 × 20 mL). Solvent exchange was carried out with methanol (3 × 20 mL) at room temperature. The material was then evacuated under vacuum at 150 °C for 5 hours, yielding 0.4544 g of Cu/MOF-74 in the form of reddish black crystals (63% based on H₂dhtp).

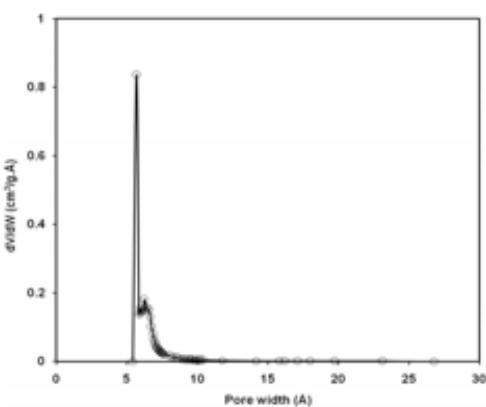


Fig. S18. Pore size distribution of the Cu-MOF-74

Oxidative cross-dehydrogenative coupling of amines and α -carbonyl aldehydes over heterogeneous Cu-MOF-74 catalyst: a ligand-and base-free approach

J. Mol. Catal. A **2015**, *409*, 110

2.2. Synthesis of the metal-organic framework Cu-MOF-74

In a typical preparation, a solid mixture of H₂dhtp (H₂dhtp = 2,5-dihydroxyterephthalic acid; 0.495 g, 2.5 mmol), and

Cu(NO₃)₂·3H₂O (1.21 g, 5 mmol) was dissolved in a mixture of DMF (DMF = *N,N*'-dimethylformamide; 47 mL), and 2-propanol (3 mL). The resulting solution was then distributed to seven 10 mL vials. The vials were heated at 85 °C in an isothermal oven for 18 h. After cooling the vials to room temperature, the solid product was removed by decanting with mother liquor and washed in DMF (3 × 20 mL). Solvent exchange was carried out with 2-propanol (3 × 20 mL) at room temperature. The material was then evacuated under vacuum at 150 °C for 5 h, yielding 0.50 g of Cu-MOF-74, Cu₂(DOBDC), in the form of reddish black crystals (62% yield based on H₂dhtp).

Direct C-C coupling of indoles with alkylamides via oxidative C-H functionalization using Fe₃O(BDC)₃ as a productive heterogeneous catalyst

J. Mol. Catal. A **2016**, *423*, 433

Direct arylation of benzoazoles with aldehydes utilizing metal-organic framework Fe₃O(BDC)₃ as a recyclable heterogeneous catalyst

RSC Adv., **2017**, *7*, 1423-1431

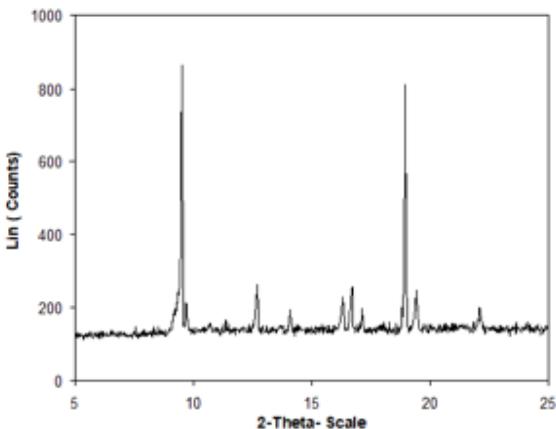


Fig. S1. X-ray powder diffractograms of the Fe₃O(BDC)₃.

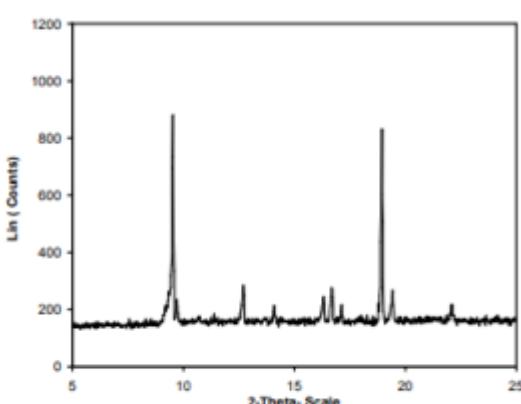


Fig. S1. X-ray powder diffractograms of the Fe₃O(BDC)₃.

2.1. Synthesis of the metal-organic framework Fe₃O(BDC)₃

The Fe₃O(BDC)₃ was synthesized in accordance with a literature method [49,50]. In a representative preparation, H₂BDC (H₂BDC = 1,4-benzenedicarboxylic acid; 0.199 g, 1.2 mmol), FeCl₃·6H₂O (0.325 g, 2.0 mmol) and were added to a mixture of ethanol (60 ml) and DMF (DMF = *N,N*'-dimethylformamide; 60 ml). The mixture was magnetically stirred for 30 min to dissolve the solids completely. The solution was equally added into eight 20-ml vials. The vials were securely covered and then heated at 85 °C for 48 h, forming the framework as light orange crystals. Subsequent to this period, the vials were cooled down to room temperature, and the crystals were collected by decantation. The as-synthesized framework was washed with DMF (3 × 10 ml), and immersed in methanol (3 × 10 ml). The framework crystals were then dried in a Shlenkline under vacuum at 140 °C for 6 h, producing 0.318 g of Fe₃O(BDC)₃ in the form of brick red crystals (47% yield based on H₂BDC).

Synthesis of the metal-organic framework Fe₃O(BDC)₃

In a representative preparation, H₂BDC (H₂BDC=1,4-benzenedicarboxylic acid; 0.199 g, 1.2 mmol), FeCl₃·6H₂O (0.325 g, 2.0 mmol) and were added to a mixture of ethanol (60

mL) and DMF (DMF = *N,N*-dimethylformamide; 60 mL). The mixture was magnetically stirred for 30 min to dissolve the solids completely. The solution was equally added into eight 20-mL vials. The vials were securely covered and then heated at 85 °C for 48 h, forming the framework as light orange crystals. Subsequent to this period, the vials were cooled down to room temperature, and the crystals were collected by decantation. The as-synthesized framework was washed with DMF (3× 10 mL), and immersed in methanol (3× 10 mL). The framework crystals were then dried in a shlenkline under vacuum at 140 °C for 6 h, producing 0.318g of $\text{Fe}_3\text{O}(\text{BDC})_3$ in the form of brick red crystals (47 % yield based on H_2BDC).

Efficient and Recyclable $\text{Cu}_2(\text{BPDC})_2(\text{DABCO})$ -Catalyzed Direct Amination of Activated Sp₃ C-H Bonds by N-H Heterocycles

Appl. Catal. A **2016**, *510*, 27

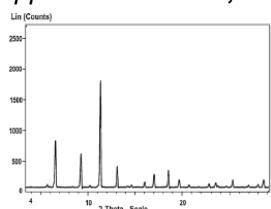


Fig. S1. X – ray powder diffractogram of the MOF-199

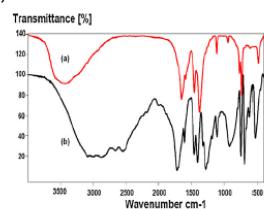


Fig. S2. FT – IR spectra of the MOF-199 (a) and 1,3,5-benzenetricarboxylic acid (b)

Oxidative cross-dehydrogenative coupling of amines and-carbonyl aldehydes over heterogeneous Cu-MOF-74 catalyst: a ligand-and base-free approach

J. Mol. Catal. A **2015**, *409*, 110

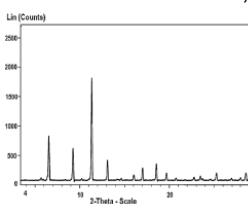


Fig S3. X – ray powder diffractogram of the $\text{Cu}_3(\text{BTC})_2$

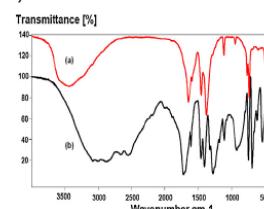


Fig S4. FT – IR spectra of the $\text{Cu}_3(\text{BTC})_2$ (a) and 1,3,5-benzenetricarboxylic acid (b)

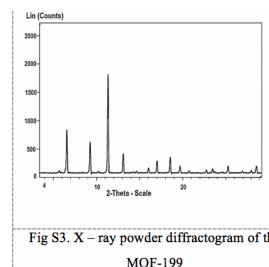


Fig S3. X – ray powder diffractogram of the MOF-199

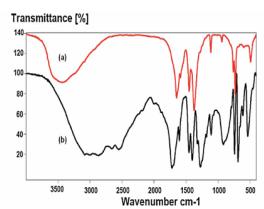


Fig S4. FT – IR spectra of the MOF-199 (a) and 1,3,5-benzenetricarboxylic acid (b)

Propargylamine synthesis via sequential methylation and C-H functionalization of N-methylanilines and terminal alkynes under metal-organic-framework $\text{Cu}_2(\text{BDC})_2(\text{DABCO})$ catalysis

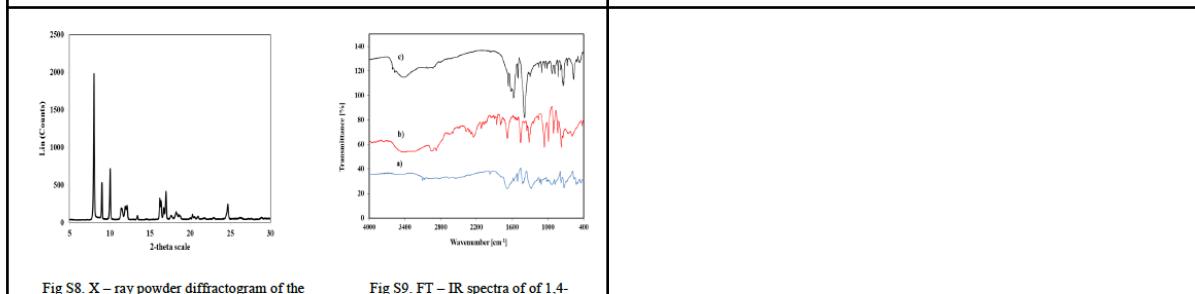
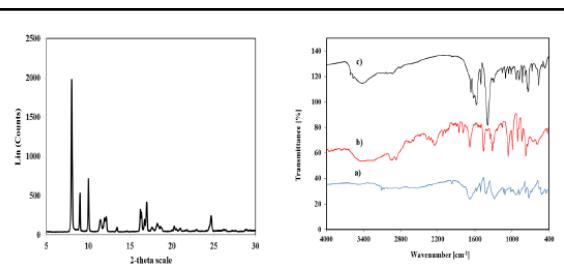
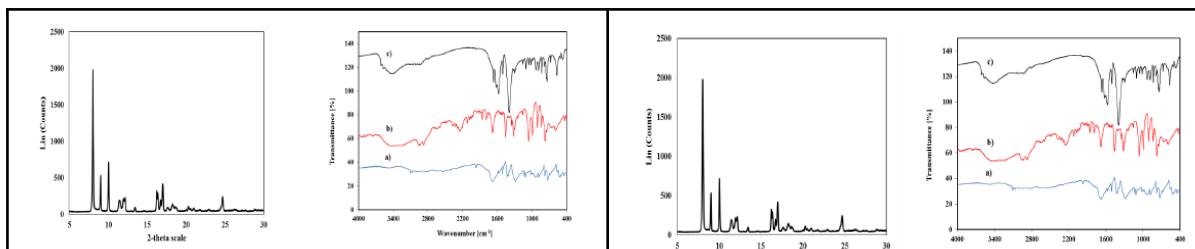
J. Catal. **2014**, *319*, 258

Efficient and Recyclable $\text{Cu}_2(\text{BPDC})_2(\text{DABCO})$ -Catalyzed Direct Amination of Activated Sp₃ C-H Bonds by N-H Heterocycles

Appl. Catal. A **2016**, *510*, 27

Quinoxaline synthesis via oxidative cyclization reaction using metal-organic framework Cu(BDC) as an efficient heterogeneous catalyst

Appl. Catal. A **2015**, *491*, 189

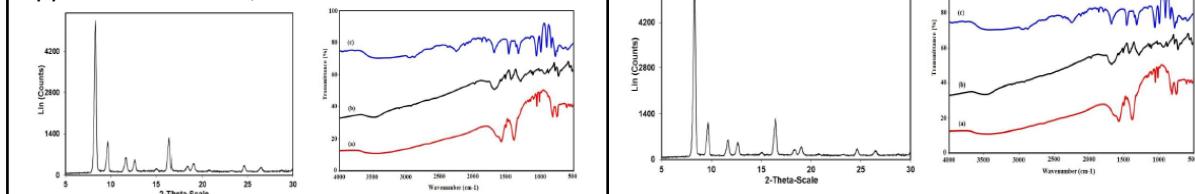


Oxidative cross-dehydrogenative coupling of amines and-carbonyl aldehydes over heterogeneous Cu-MOF-74 catalyst: a ligand-and base-free approach

J. Mol. Catal. A **2015**, *409*, 110

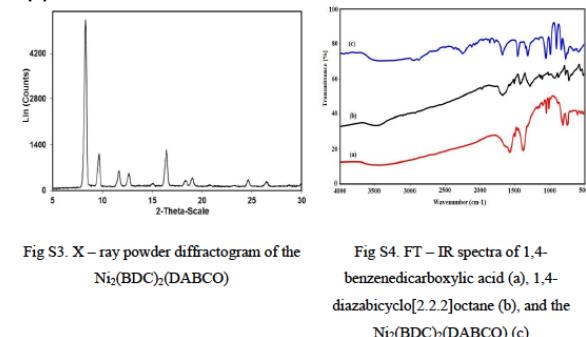
Efficient and Recyclable $\text{Cu}_2(\text{BPDC})_2(\text{DABCO})$ -Catalyzed Direct Amination of Activated Sp³ C-H Bonds by N-H Heterocycles

Appl. Catal. A **2016**, *510*, 27



Quinoxaline synthesis via oxidative cyclization reaction using metal-organic framework $\text{Cu}(\text{BDC})$ as an efficient heterogeneous catalyst

Appl. Catal. A **2015**, *491*, 189



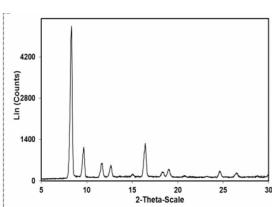


Fig S6. X – ray powder diffractogram of the $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$

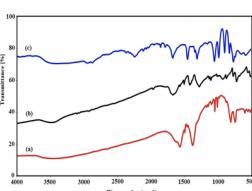


Fig S7. FT – IR spectra of 1,4-benzenedicarboxylic acid (a), 1,4-diazabicyclo[2.2.2]octane (b), and the $\text{Ni}_2(\text{BDC})_2(\text{DABCO})$ (c)

Propargylamine synthesis via sequential methylation and C-H functionalization of N-methylanilines and terminal alkynes under metal-organic-framework $\text{Cu}_2(\text{BDC})_2(\text{DABCO})$ catalysis

J. Catal. **2014**, *319*, 258

Propargylamine synthesis via sequential methylation and C-H functionalization of N-methylanilines and terminal alkynes under metal-organic-framework $\text{Cu}_2(\text{BDC})_2(\text{DABCO})$ catalysis

J. Catal. **2014**, *319*, 258

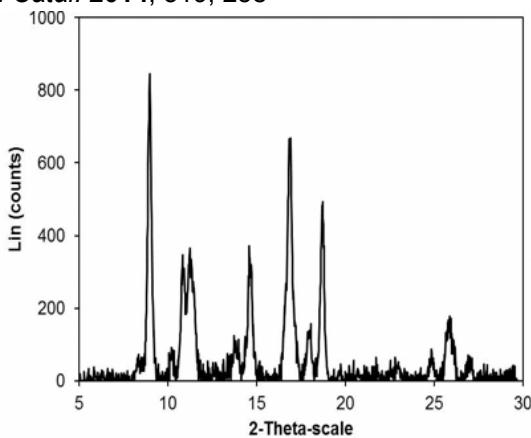


Fig S5. X – ray powder diffractogram of the $\text{Cu}_2(\text{BDC})_2(\text{BPY})$

Oxidative cross-dehydrogenative coupling of amines and carbonyl aldehydes over heterogeneous Cu-MOF-74 catalyst: a ligand-and base-free approach

J. Mol. Catal. A **2015**, *409*, 110

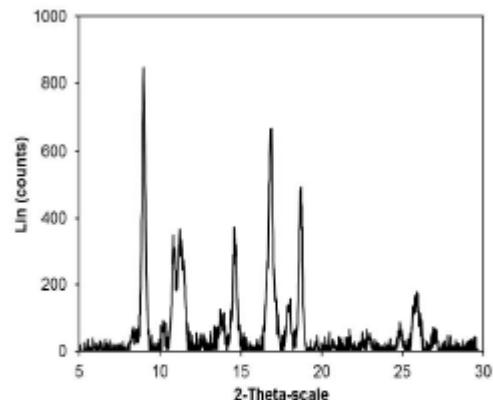


Fig S5. X – ray powder diffractogram of the $\text{Cu}_2(\text{BDC})_2(\text{BPY})$

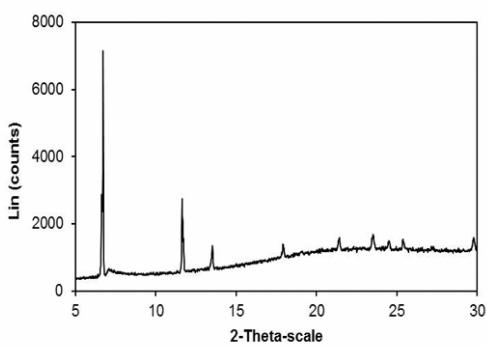


Fig S10. X – ray powder diffractogram of the Co-MOF-74

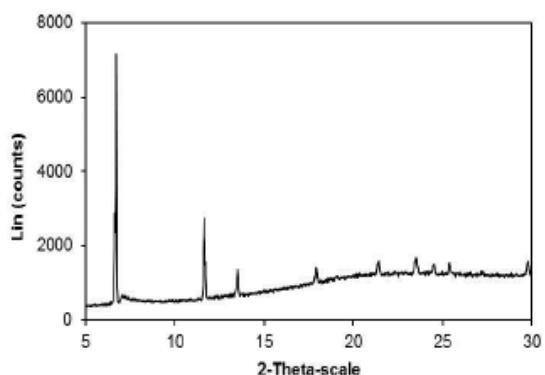
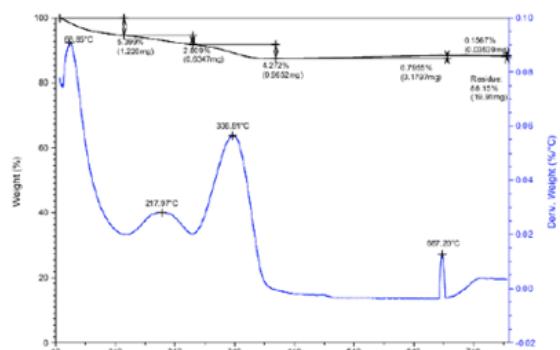
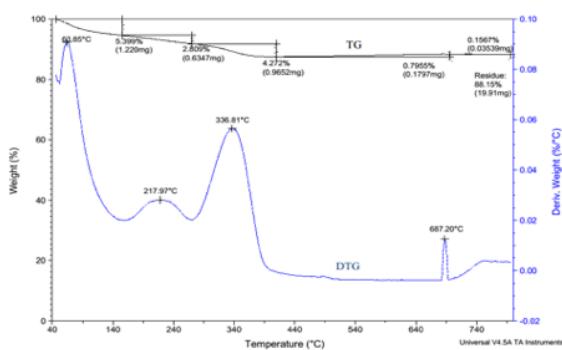


Fig S7. X – ray powder diffractogram of the Co-MOF-74

Superparamagnetic Copper Ferrite Nanoparticles as an Efficient Heterogeneous Catalyst for the α -Arylation of 1,3-Diketones with CC Cleavage
Chemcatchem **2014**, 6, 815
<https://chemistry-europe.onlinelibrary.wiley.com/doi/10.1002/cctc.201300708>

Copper ferrite superparamagnetic nanoparticles as a heterogeneous catalyst for directed phenol/formamide coupling
Tetrahedron Lett. **2017**, 58, 3370
<https://www.sciencedirect.com/science/article/abs/pii/S0040403917309048>



As described by the authors, CuFe_2O_4 catalyst in *Tetrahedron Lett.* **2017**, 58, 3370 was **prepared** by the authors while CuFe_2O_4 catalyst in *Chemcatchem* **2014**, 6, 815 was **purchased** from Aldrich.

Synthesis of imidazo[1,5-a]pyridines via oxidative amination of the C(sp³)–H bond under air using metal–organic framework Cu-MOF-74 as an efficient heterogeneous catalyst
RSC Adv., **2016**, 6, 36039
<https://pubs.rsc.org/en/content/articlelanding/2016/ra/c6ra00852f#!divAbstract>

O-Acetyl-Substituted Phenol Ester Synthesis via Direct Oxidative Esterification Utilizing Ethers as an Acylating Source with Cu₂(dhtp) Metal–Organic Framework as a Recyclable Catalyst
Ind. Eng. Chem. Res. **2016**, 55, 11829
<https://pubs.acs.org/doi/10.1021/acs.iecr.6b02733>

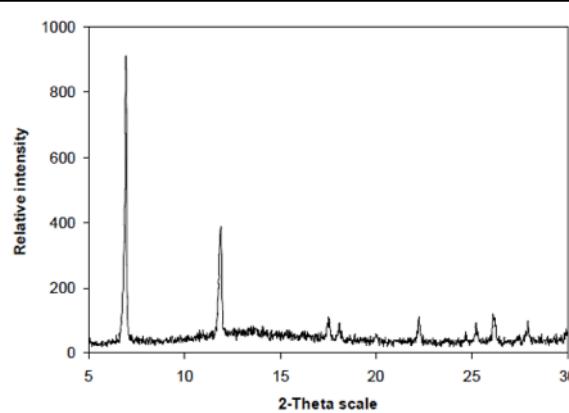


Fig. S1. X-ray powder diffractograms of the Cu-MOF-74.

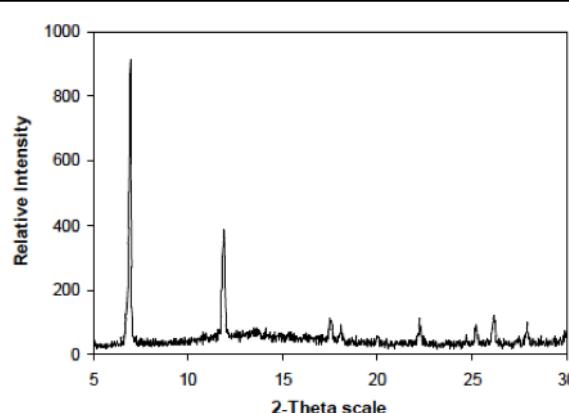


Fig. S1. X-ray powder diffractograms of the Cu₂(dhtp).

As described by the authors, the synthetic methods of this catalyst were different in these two papers.

[1,5-Benzodiazepine synthesis via cyclocondensation of 1,2-diamines with ketones using iron-based metal-organic framework MOF-235 as an efficient heterogeneous catalyst](#)
J. Catal. **2016**, *333*, 94

[Synthesis of \$\alpha\$ -acyloxy ethers via direct esterification of carboxylic acids with ethers under metal-organic framework catalysis](#)
Tetrahedron **2017**, *73*, 5883

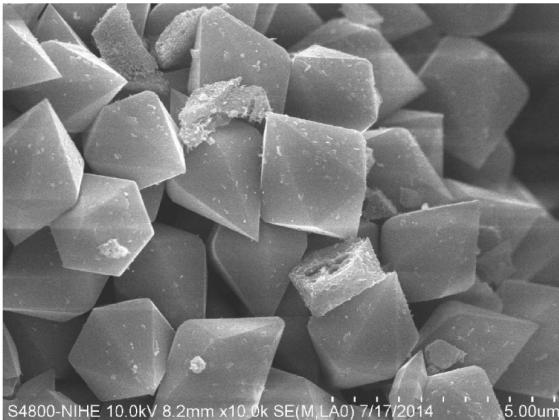


Fig. S2. SEM micrograph of the MOF-235.

Figure information was complete

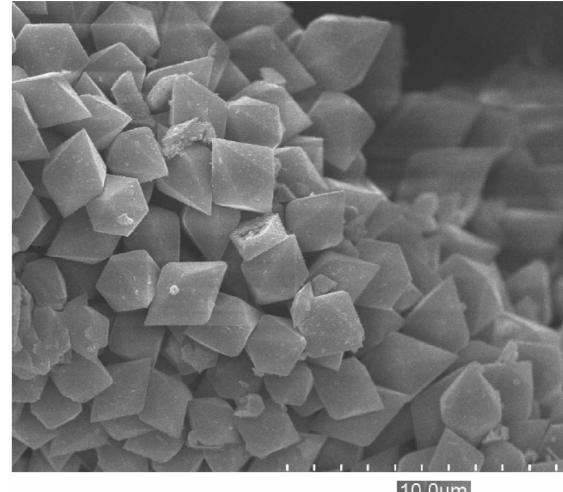


Fig. S2. SEM micrograph of the MOF-235.

Figure information was cropped except for scale

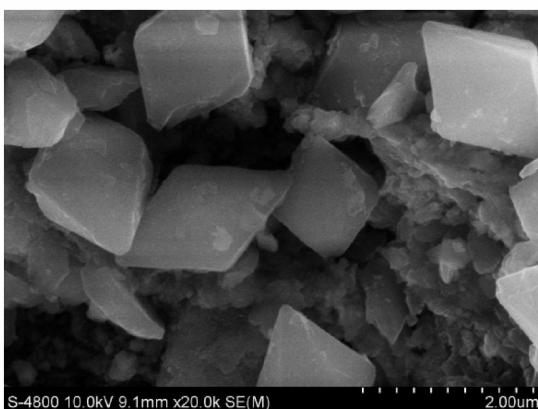


Fig. S2. SEM micrograph of the MOF-235.

[A new pathway to 2-arylbenzoxazoles and 2-arylbenzothiazoles via one-pot oxidative cyclization reactions under iron-organic framework catalysis](#)

Catal. Lett. **2019**, *149*, 2035

Figure information was partially cropped

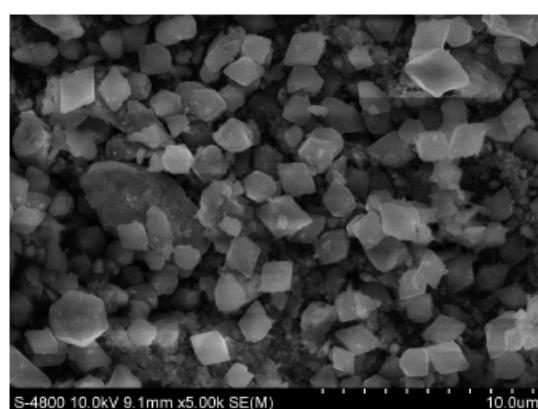


Fig. S2. SEM micrograph of the $\text{Fe}_3\text{O}(\text{BDC})_3$.

[Direct arylation of benzoazoles with aldehydes utilizing metal-organic framework \$\text{Fe}_3\text{O}\(\text{BDC}\)_3\$ as a recyclable heterogeneous catalyst](#)

RSC Adv., **2017**, *7*, 1423-1431

Figure information was partially cropped

[1,5-Benzodiazepine synthesis via cyclocondensation of 1,2-diamines with ketones using iron-based metal-organic framework MOF-235 as an efficient heterogeneous catalyst](#)

J. Catal. **2016**, *333*, 94

[Synthesis of a-acyloxy ethers via direct esterification of carboxylic acids with ethers under metal-organic framework catalysis](#)

Tetrahedron **2017**, *73*, 5883

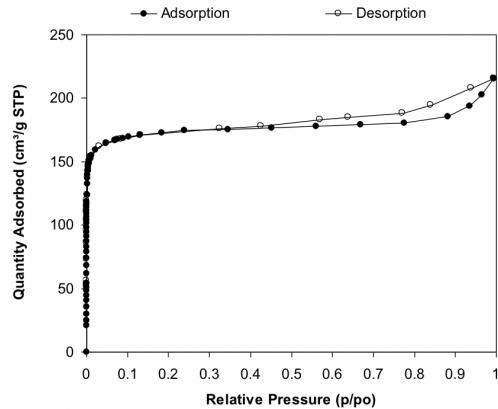


Fig. S5. Nitrogen adsorption/desorption isotherm of the MOF-235. Adsorption data are shown as closed circles and desorption data as open circles.

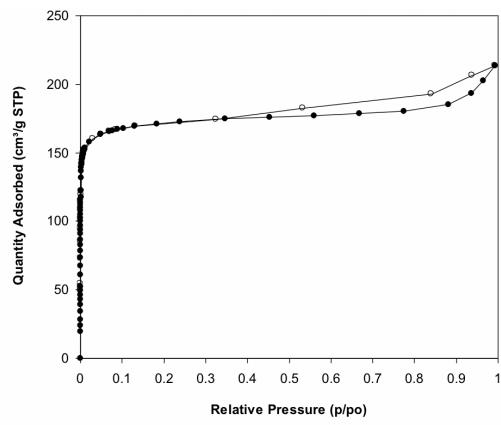


Fig. S5. Nitrogen adsorption/desorption isotherm of the MOF-235. Adsorption data are shown as closed circles and desorption data as open circles.

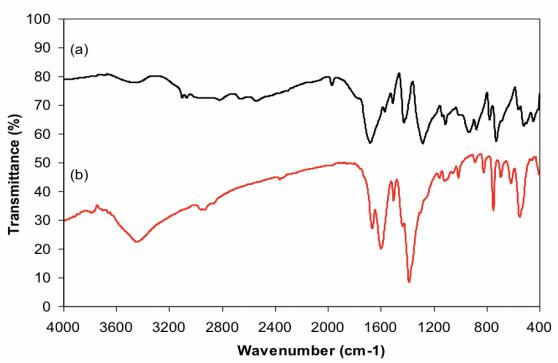


Fig. S7. FT-IR spectra of biphenyl-4,4'-dicarboxylic acid (a), and the MOF-235 (b).

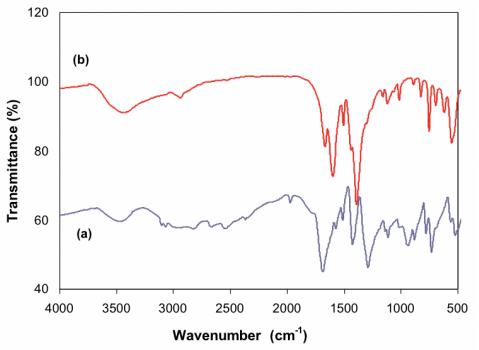


Fig. S7. FT-IR spectra of 1,4-benzenedicarboxylic acid (a), and MOF-235 (b).

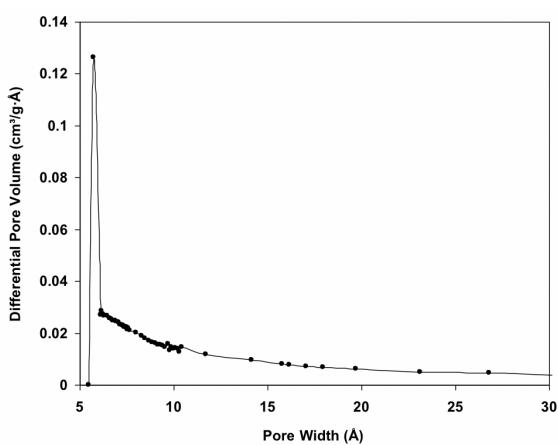


Fig. S4. Pore size distribution of the MOF-235.

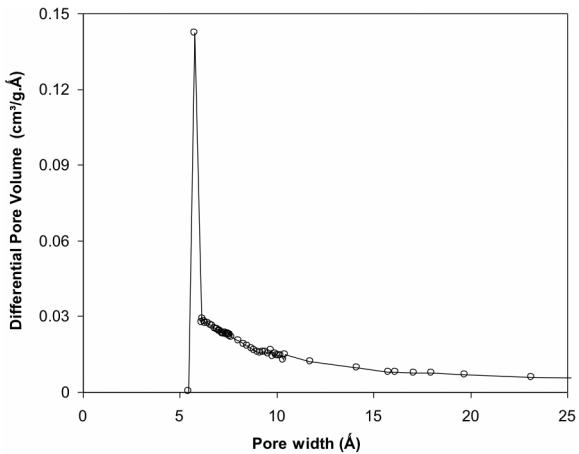


Fig. S4. Pore size distribution of the MOF-235.

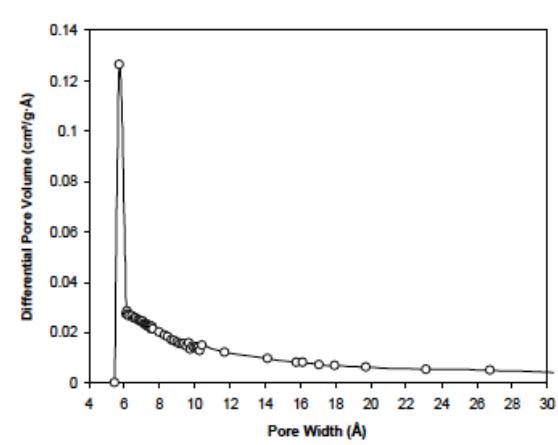


Fig. S4. Pore size distribution of the Fe₃O(BDC)₃.

Direct arylation of benzoazoles with aldehydes utilizing metal-organic framework Fe₃O(BDC)₃ as a recyclable heterogeneous catalyst
RSC Adv., 2017, 7, 1423-1431

A new pathway to 2-arylbenzoxazoles and 2-arylbenzothiazoles via one-pot oxidative cyclization reactions under iron-organic framework catalysis

<https://link.springer.com/article/10.1007/s10562-019-02747-1>

Catalysis Letters, 2019, 149, 2035

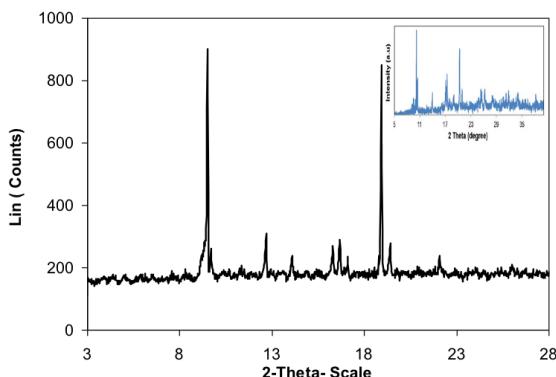


Fig. S1. X-ray powder diffractograms of the MOF-235 and simulated XRD pattern (blue).

Direct arylation of benzoazoles with aldehydes utilizing metal-organic framework $\text{Fe}_3\text{O}(\text{BDC})_3$ as a recyclable heterogeneous catalyst

RSC Adv., 2017, 7, 1423-1431

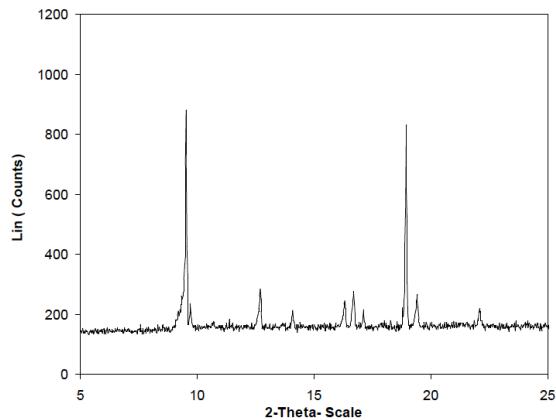


Fig. S1. X-ray powder diffractograms of the $\text{Fe}_3\text{O}(\text{BDC})_3$.

[Application of iron-based metal-organic frameworks in catalysis: Oxidant-promoted formation of coumarins using \$\text{Fe}_3\text{O}\(\text{BPDC}\)_3\$ as an efficient heterogeneous catalyst](#)

Catal. Sci. Technol., 2016, 6, 5916-5926

[Direct alkenylation of 2-substituted azaarenes with carbonyls via C-H bond activation using iron-based metal-organic framework \$\text{Fe}_3\text{O}\(\text{BPDC}\)_3\$ as an efficient heterogeneous catalyst](#)

J. Mol. Catal. A 2016, 420, 237

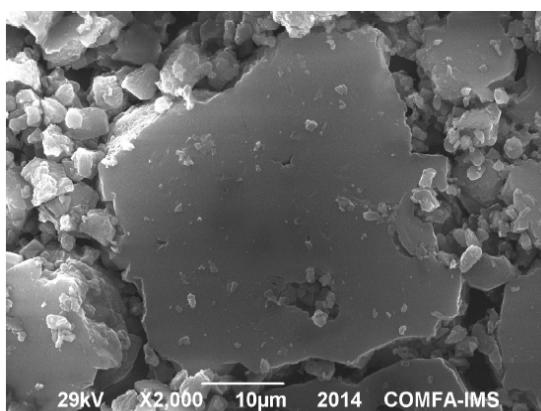


Fig. S2. SEM micrograph of the $\text{Fe}_3\text{O}(\text{BDC})_3$.

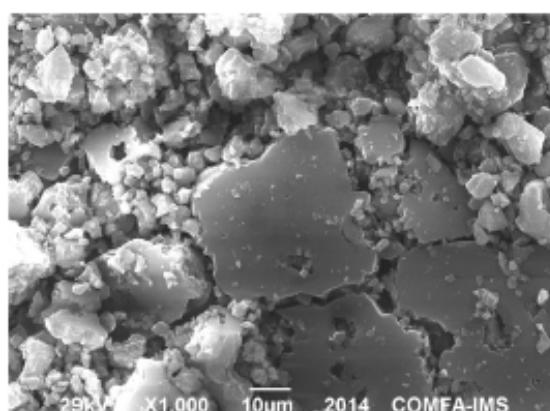


Fig. 1. SEM and TEM micrograph

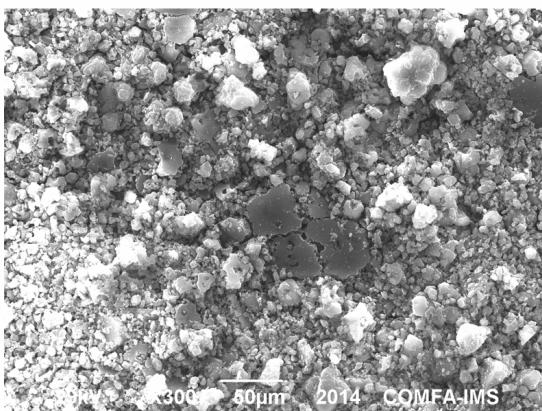


Fig. S2. SEM micrograph of the $\text{Fe}_3\text{O}(\text{BPDC})_3$.

Iron-catalyzed domino sequences: One-pot oxidative synthesis of quinazolinones using metal-organic framework $\text{Fe}_3\text{O}(\text{BPDC})_3$ as an efficient heterogeneous catalyst
Chem. Eng. J. 2016, 284, 778

[Application of iron-based metal-organic frameworks in catalysis: Oxidant-promoted formation of coumarins using \$\text{Fe}_3\text{O}\(\text{BPDC}\)_3\$ as an efficient heterogeneous catalyst](#)

Catal. Sci. Technol., 2016, 6, 5916-5926

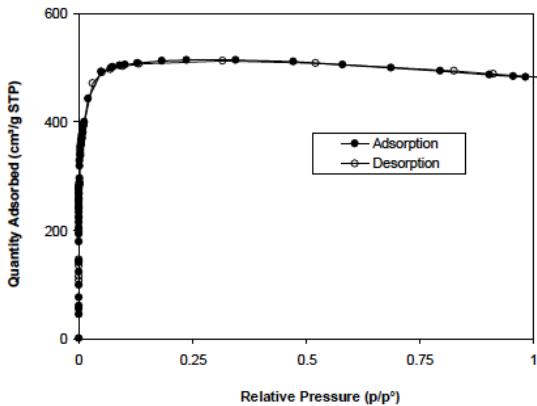


Fig. S5. Nitrogen adsorption/desorption isotherm of the $\text{Fe}_3\text{O}(\text{BPDC})_3$. Adsorption data are shown as closed circles and desorption data as open circles.

[Direct alkenylation of 2-substituted azaarenes with carbonyls via C-H bond activation using iron-based metal-organic framework \$\text{Fe}_3\text{O}\(\text{BPDC}\)_3\$ as an efficient heterogeneous catalyst](#)

J. Mol. Catal. A 2016, 420, 237

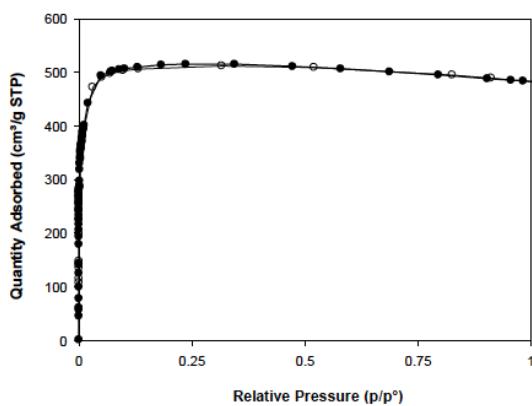


Fig. S3. Nitrogen adsorption/desorption isotherm of the $\text{Fe}_3\text{O}(\text{BPDC})_3$. Adsorption data are shown as closed circles and desorption data as open circles.

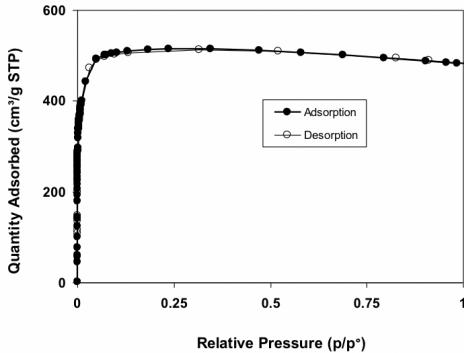


Fig. S5. Nitrogen adsorption/desorption isotherm of the $\text{Fe}_3\text{O}(\text{BPDC})_3$. Adsorption data are shown as closed circles and desorption data as open circles.

Iron-catalyzed domino sequences: One-pot oxidative synthesis of quinazolinones using metal-organic framework $\text{Fe}_3\text{O}(\text{BPDC})_3$ as an efficient heterogeneous catalyst
[Chem. Eng. J. 2016, 284, 778](#)

[Application of iron-based metal-organic frameworks in catalysis: Oxidant-promoted formation of coumarins using \$\text{Fe}_3\text{O}\(\text{BPDC}\)_3\$ as an efficient heterogeneous catalyst](#)
Catal. Sci. Technol., 2016, 6, 5916-5926

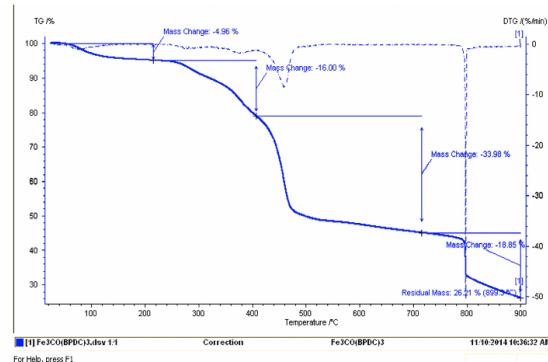


Fig. S6. TGA analysis of the $\text{Fe}_3\text{O}(\text{BPDC})_3$.

[Direct alkenylation of 2-substituted azaarenes with carbonyls via C–H bond activation using iron-based metal-organic framework \$\text{Fe}_3\text{O}\(\text{BPDC}\)_3\$ as an efficient heterogeneous catalyst](#)
J. Mol. Catal. A 2016, 420, 237

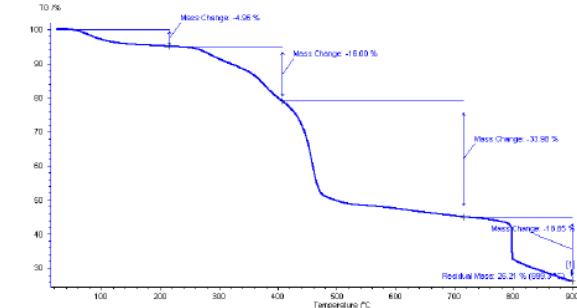
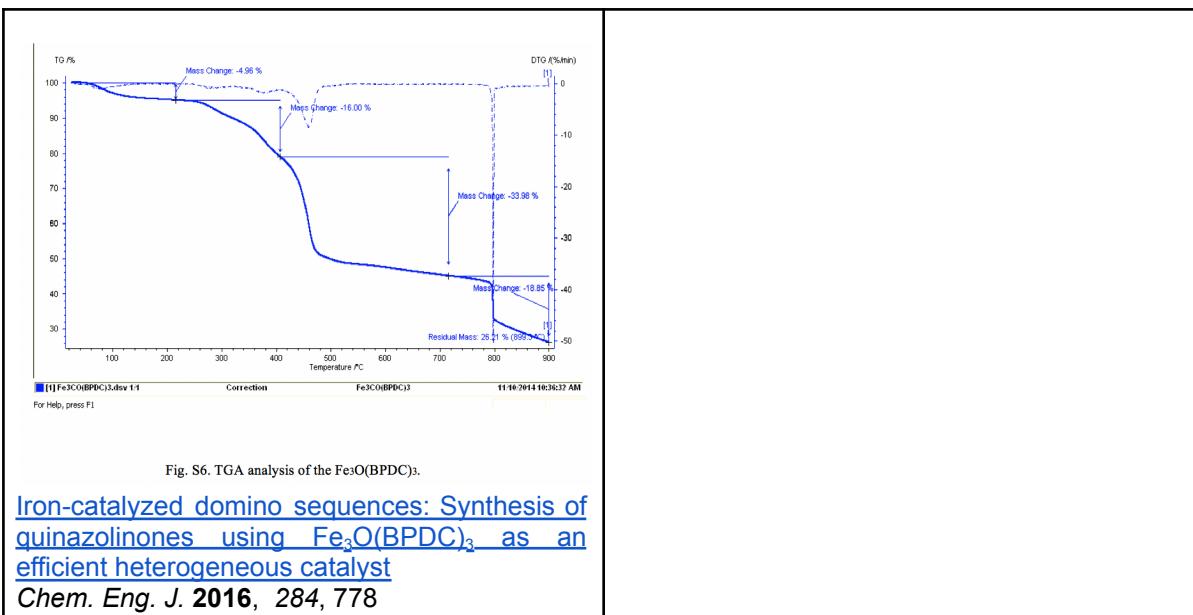


Fig. S4. TGA analysis of the $\text{Fe}_3\text{O}(\text{BPDC})_3$.



Application of iron-based metal-organic frameworks in catalysis: Oxidantpromoted formation of coumarins using $\text{Fe}_3\text{O}(\text{BPDC})_3$ as an efficient heterogeneous catalyst

Catal. Sci. Technol., **2016**, 6, 5916

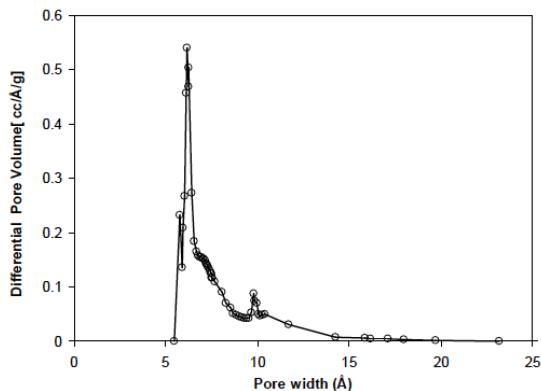


Fig. S4. Pore size distribution of the $\text{Fe}_3\text{O}(\text{BPDC})_3$.

Direct alkenylation of 2-substituted azaarenes with carbonyls via C Hbond activation using iron-based metal-organic framework $\text{Fe}_3\text{O}(\text{BPDC})_3$ as an efficient heterogeneous catalyst

J. Mol. Catal. A **2016**, 420, 237

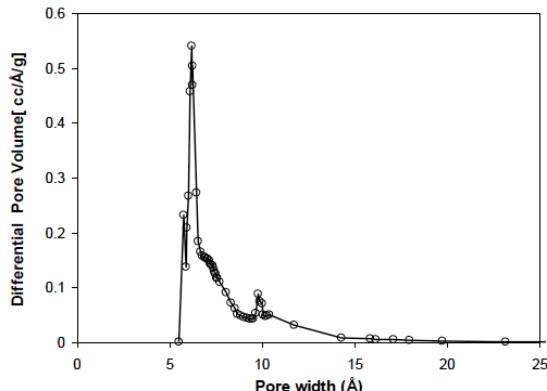


Fig. S2. Pore size distribution of the $\text{Fe}_3\text{O}(\text{BPDC})_3$.

Application of iron-based metal-organic frameworks in catalysis: Oxidantpromoted formation of coumarins using $\text{Fe}_3\text{O}(\text{BPDC})_3$ as an efficient heterogeneous catalyst

Catal. Sci. Technol., **2016**, 6, 5916-5926

Direct alkenylation of 2-substituted azaarenes with carbonyls via C Hbond activation using iron-based metal-organic framework $\text{Fe}_3\text{O}(\text{BPDC})_3$ as an efficient heterogeneous catalyst

J. Mol. Catal. A **2016**, 420, 237

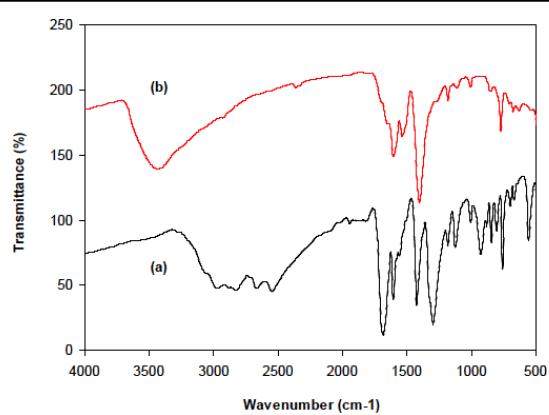


Fig. S7. FT-IR spectra of biphenyl-4,4'-dicarboxylic acid (a), and the Fe₃O(BPDC)₃ (b).

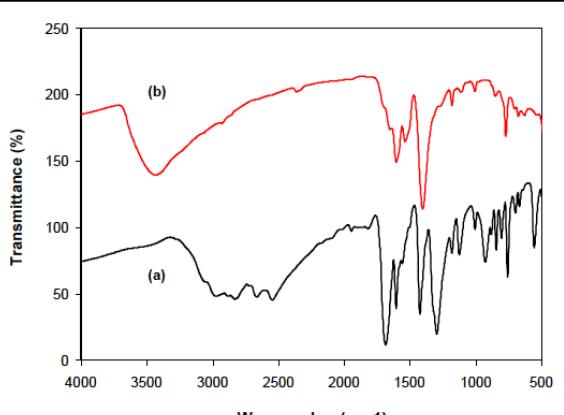


Fig. S5. FT-IR spectra of biphenyl-4,4'-dicarboxylic acid (a), and the Fe₃O(BPDC)₃ (b).

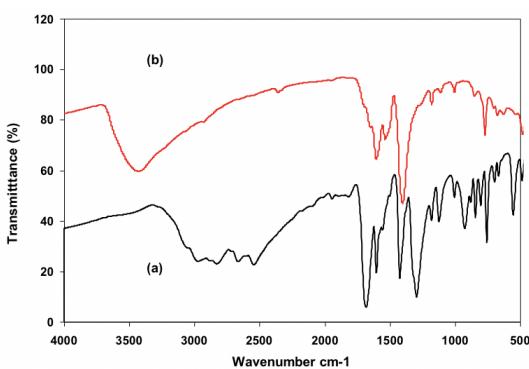


Fig. S7. FT-IR spectra of biphenyl-4,4'-dicarboxylic acid (a), and the Fe₃O(BPDC)₃ (b).

Iron-catalyzed domino sequences: Synthesis of quinazolinones using Fe₃O(BPDC)₃ as an efficient heterogeneous catalyst

Chem. Eng. J. **2016**, *284*, 778