

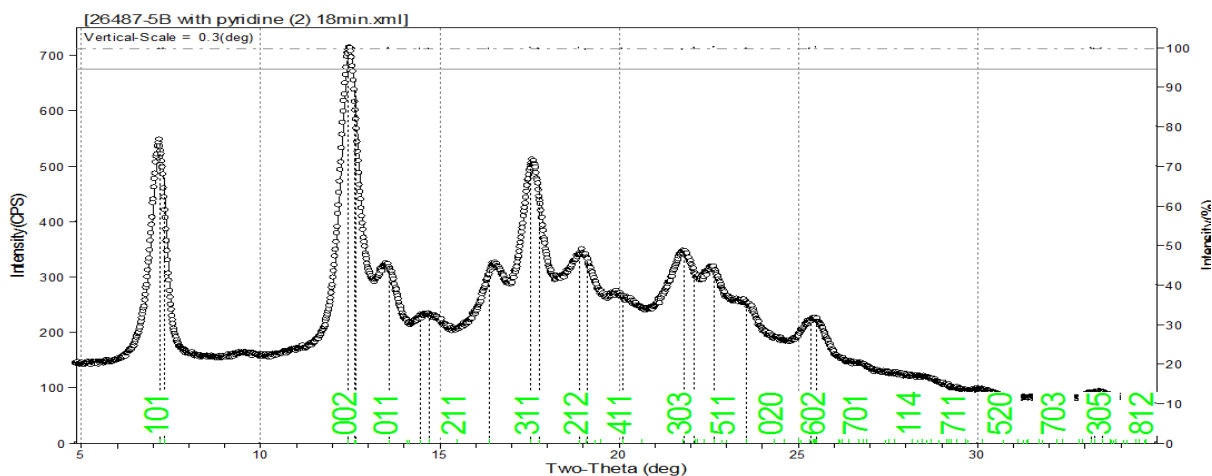
Supporting information for

## The effects of pyridine on COFs' structure and the underlying mechanism

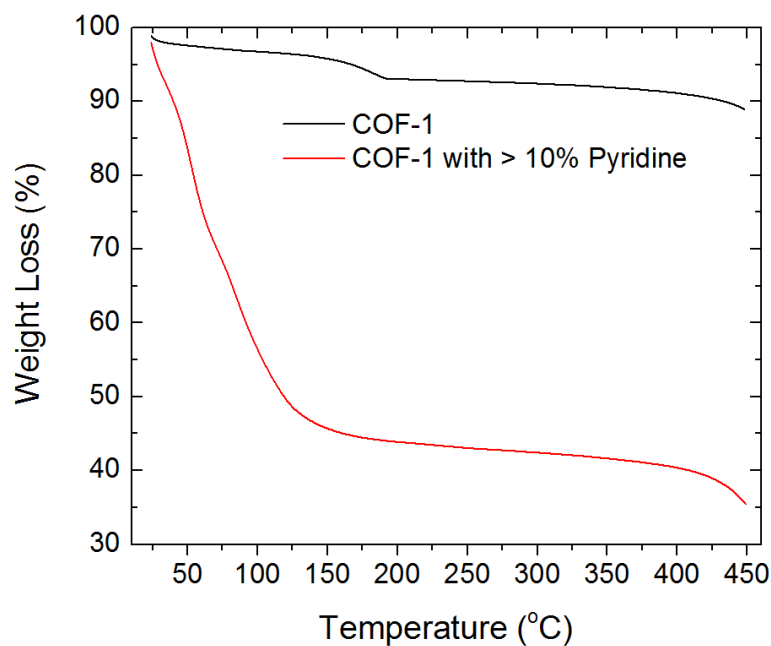
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**Figure S1.** XRD cell refinement for COF-1 with >10% pyridine sample, indicating a Pnma cell with corresponding *hkl* (green) indexing.



**Figure S2.** TGA for COF-1 and COF-1 with >10% pyridine added.

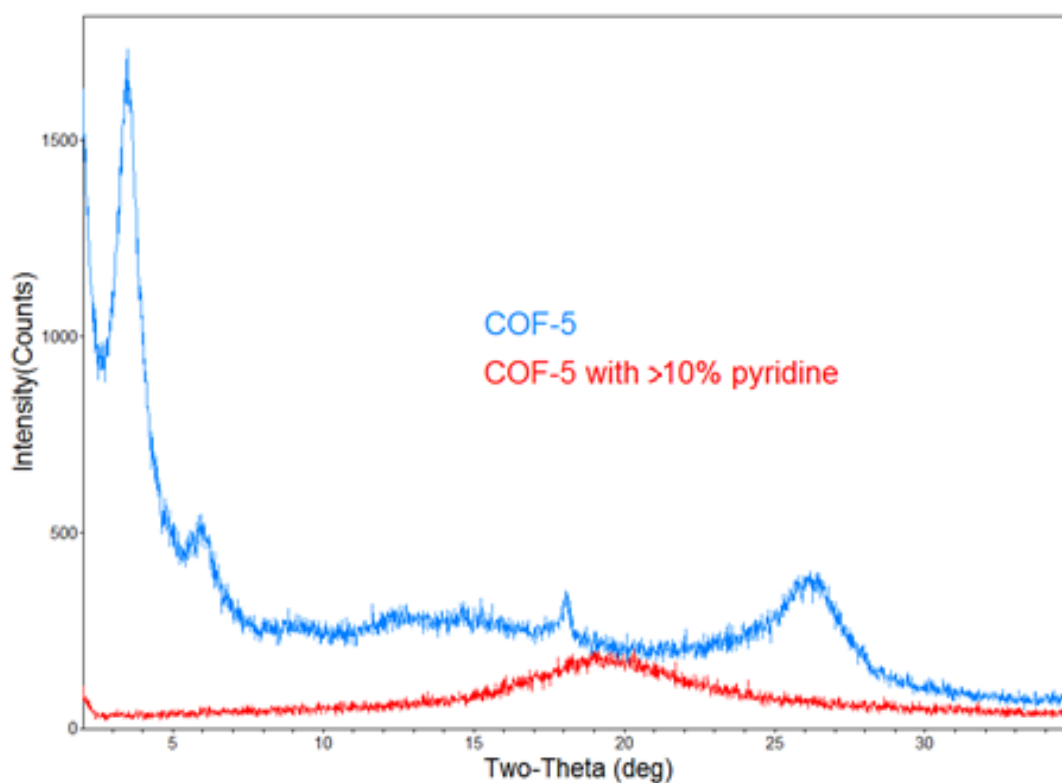
Calculations in TGA:

$$\frac{0.25 \text{ g BDBA}}{165.75 \frac{\text{g}}{\text{mol}}} * 2 \frac{\text{mol boron}}{\text{mol BDBA}} = 3.017 * 10^{-3} \text{ mol boron}$$

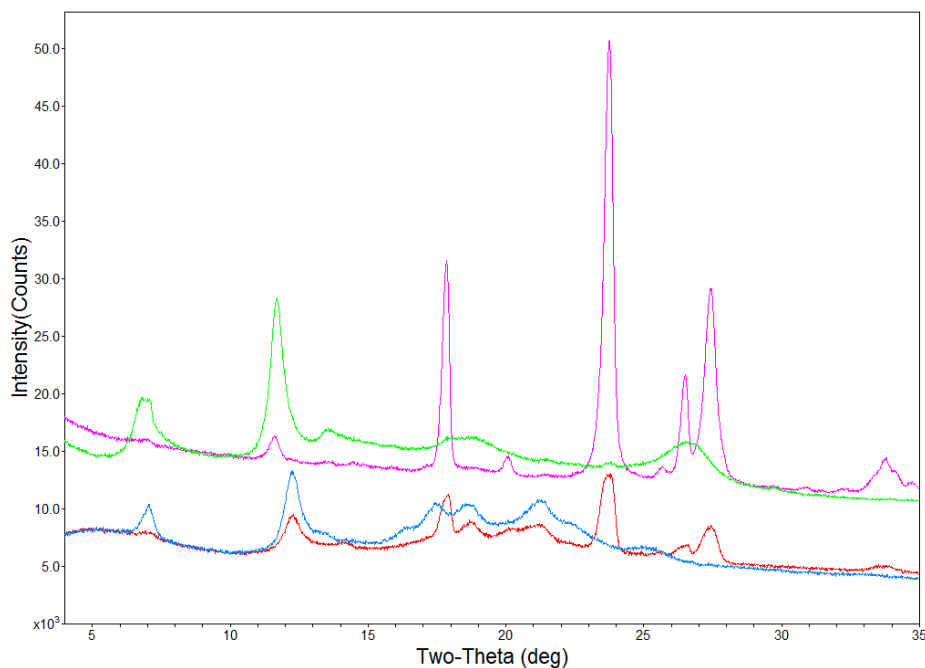
5% of boron is B – N interaction:  $0.05 * 3.017 * 10^{-3} \text{ mol} = 1.508 * 10^{-4} \text{ mol boron}$

$\therefore 1.508 * 10^{-4} \text{ mol pyridine is in B – N interaction} = 0.0119 \text{ g pyridine}$

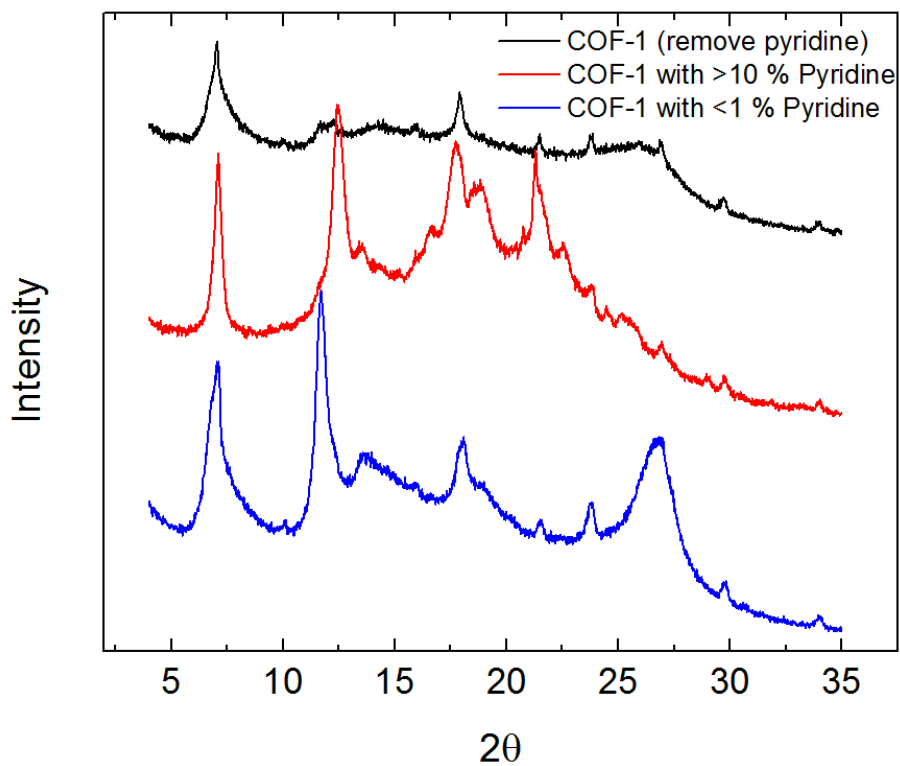
$\sim 65\% \text{ of P – COF – 1 weight is lost}$



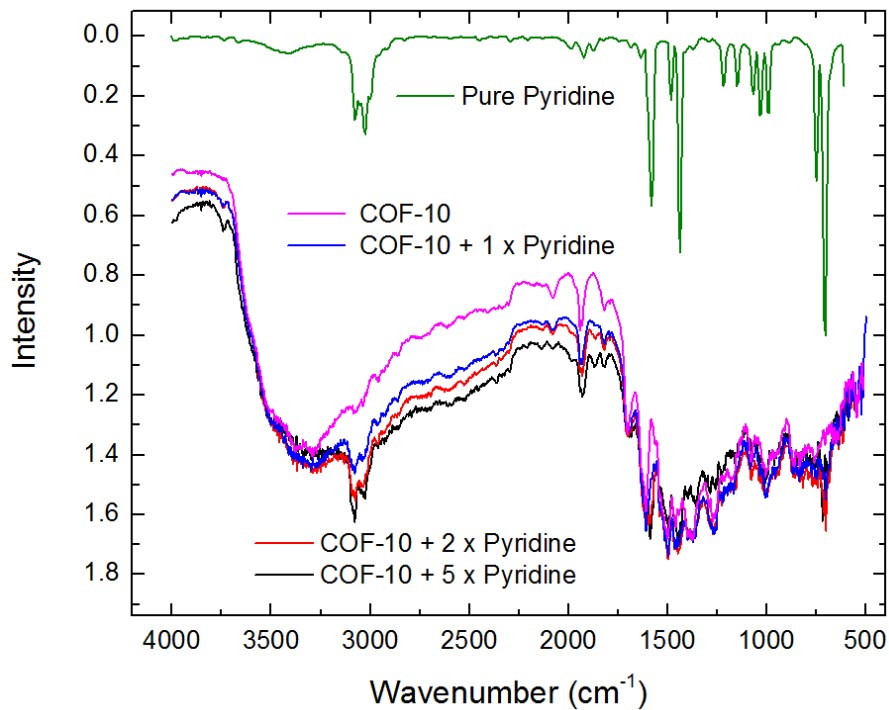
**Figure S3.** XRD patterns of COF-5 without pyridine (blue) and with >10% pyridine (red).



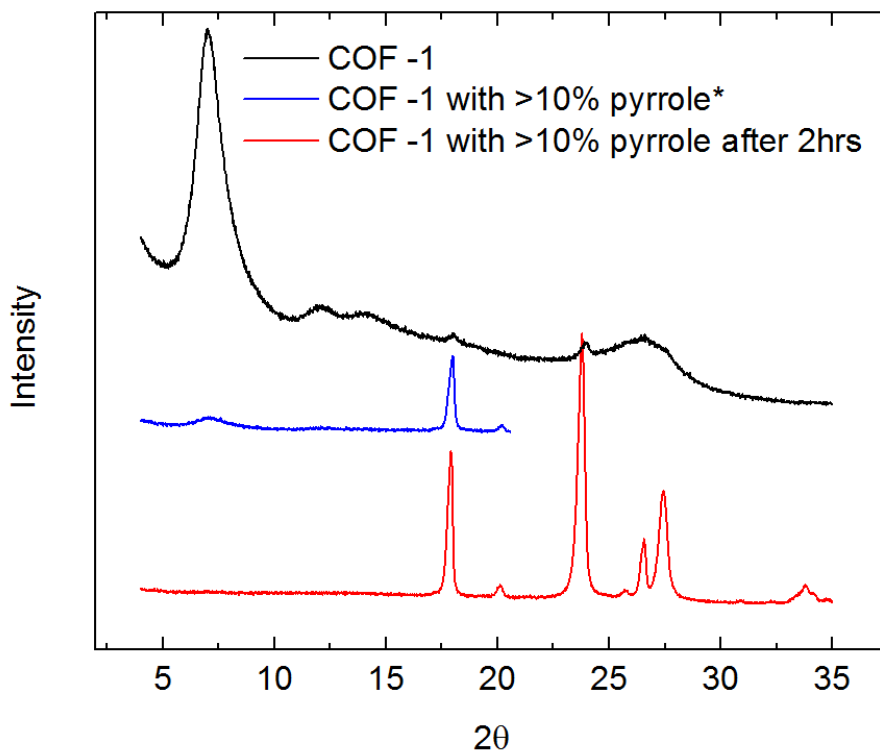
**Figure S4.** XRD spectra for COF-1 stability tests: Blue line= COF-1 (> 10% pyridine), red line= COF-1 (> 10% pyridine, 4 days), green line= COF-1 (< 1% pyridine), pink line= COF-1 (< 1% pyridine, 1 day)

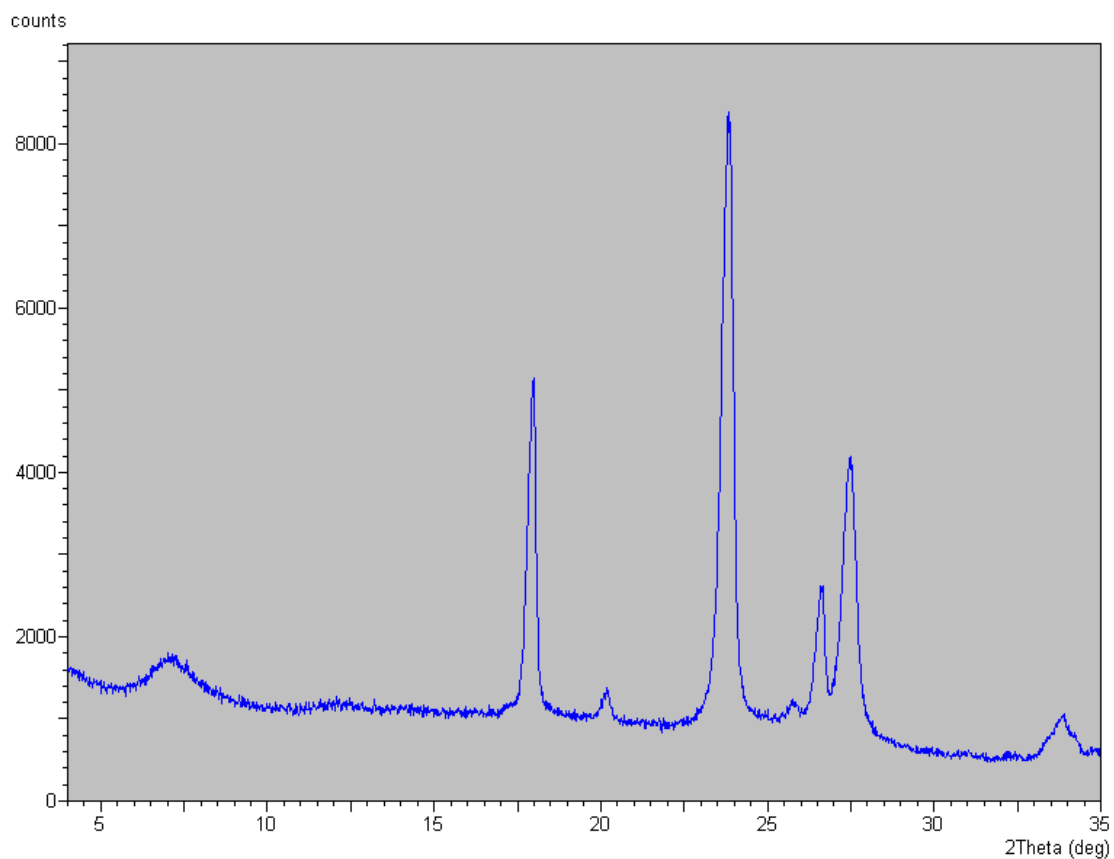


**Figure S5.** XRD spectra for COF-1 with < 1% pyridine, > 10% pyridine, and after heating at 150°C overnight

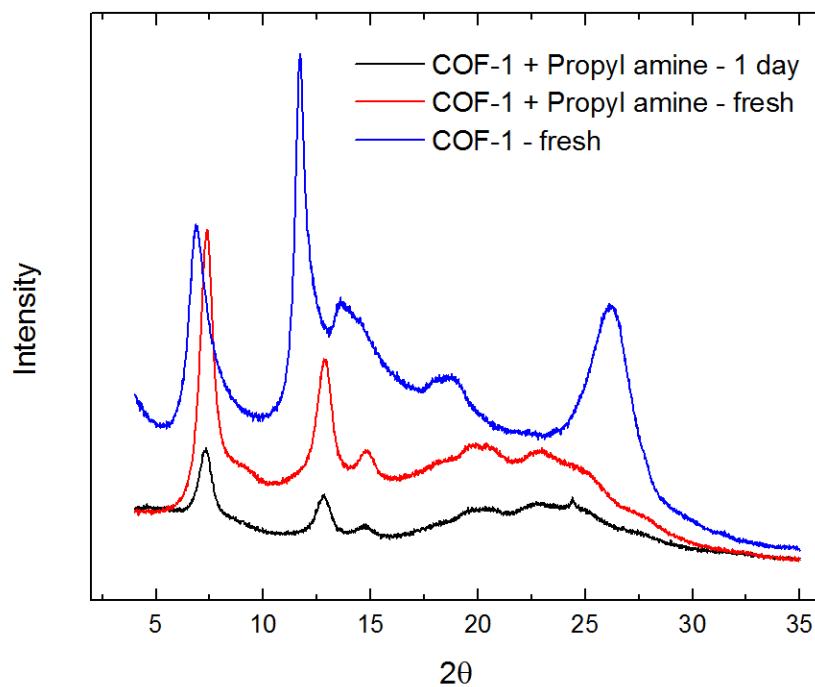


**Figure S6.** IR patterns of pure pyridine and COF-10 with 0, 1, 2, and 5 drops of pyridine. Each drop is 0.025ml in volume.

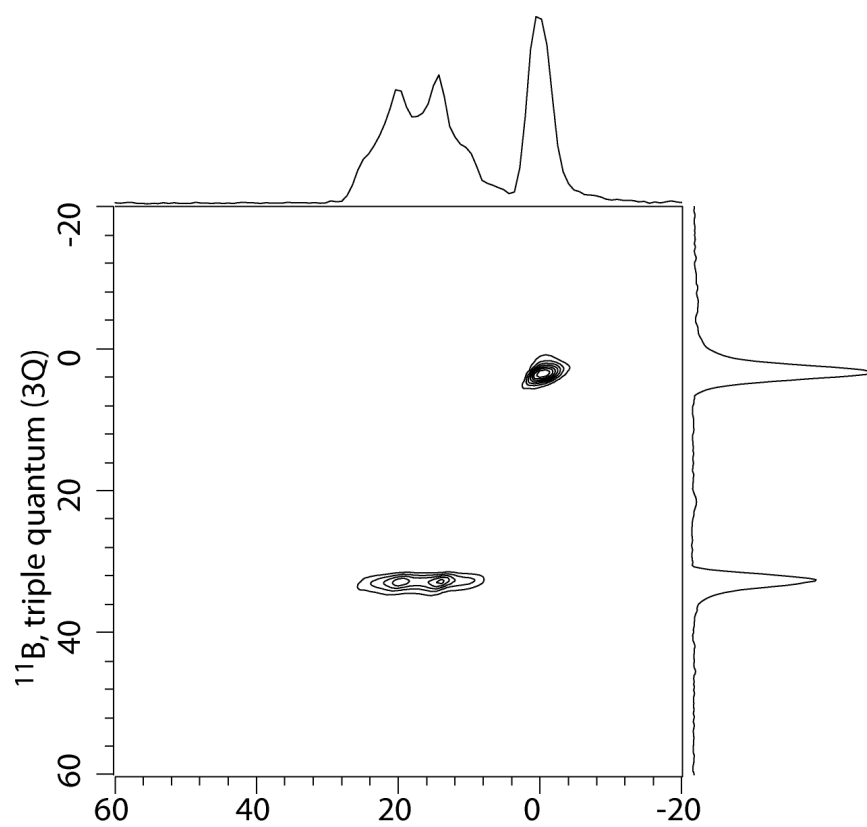




**Figure S7.** XRD spectra for COF-1 as synthesized, > 10% pyrrole, and after stored at room condition for three hours. \*Note: the as synthesis COF-1 with >10% run's data was not stored properly and a screen shot is hence attached for reference.



**Figure S8.** XRD spectra for COF-1 as synthesized, > 10% propyl amine, and after stored at room condition for one day.



**Figure S9.**  $^{11}\text{B}$  NMR for COF-1 with > 10% propyl amine.