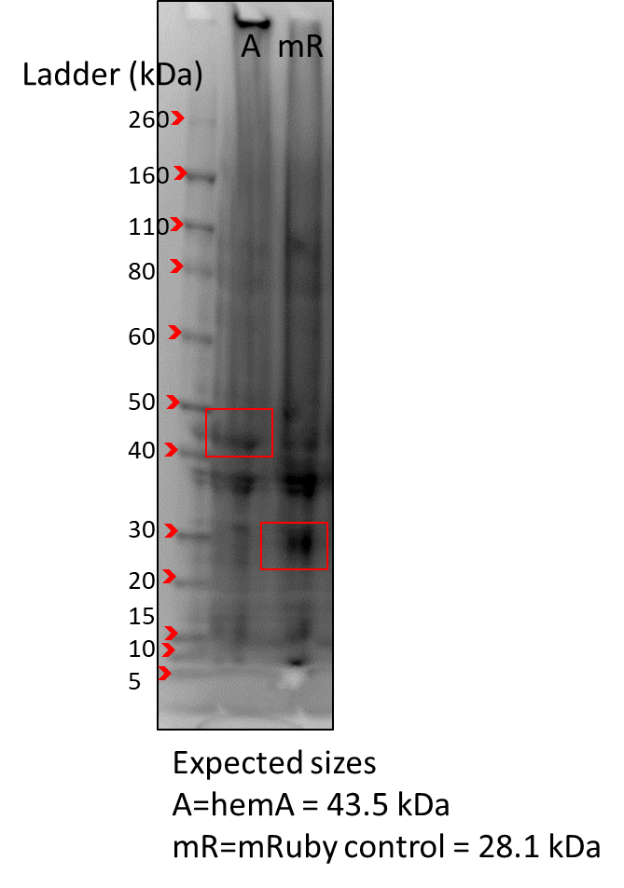
**Supplementary Information**

**Bioderived protoporphyrin IX incorporation into a metal-organic framework for enhanced photocatalytic degradation of chemical warfare agents**

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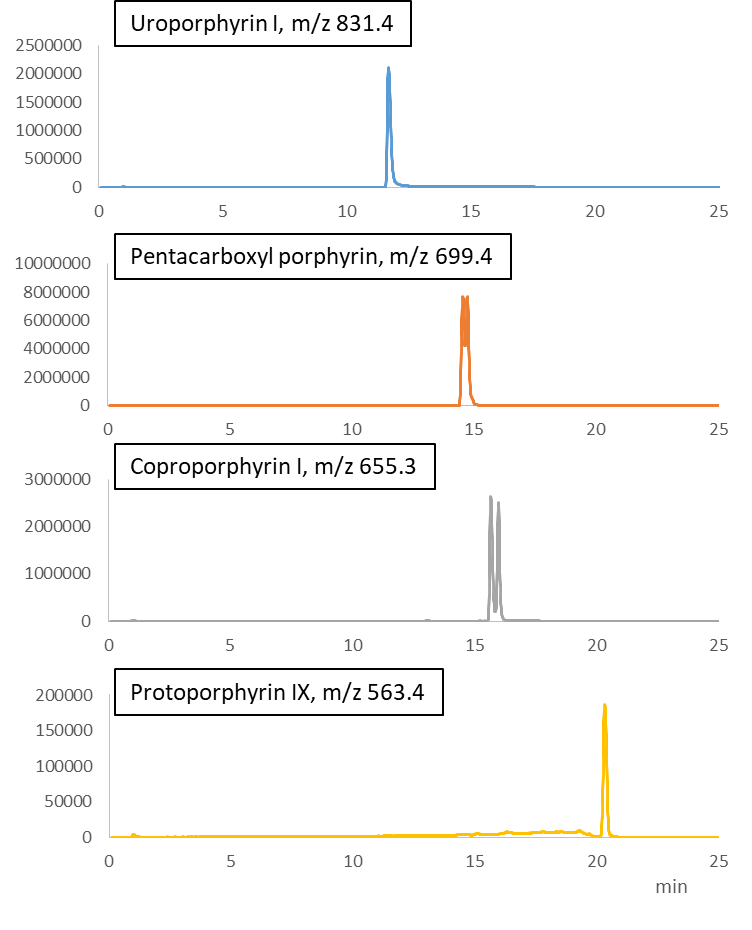
**Figure S1.** SDS PAGE analysis of whole cell lysate for *E. coli* strains expressing either HemA (lane A) or the control mRuby (lane mR). The HemA and mRuby protein bands are indicated by a red box.



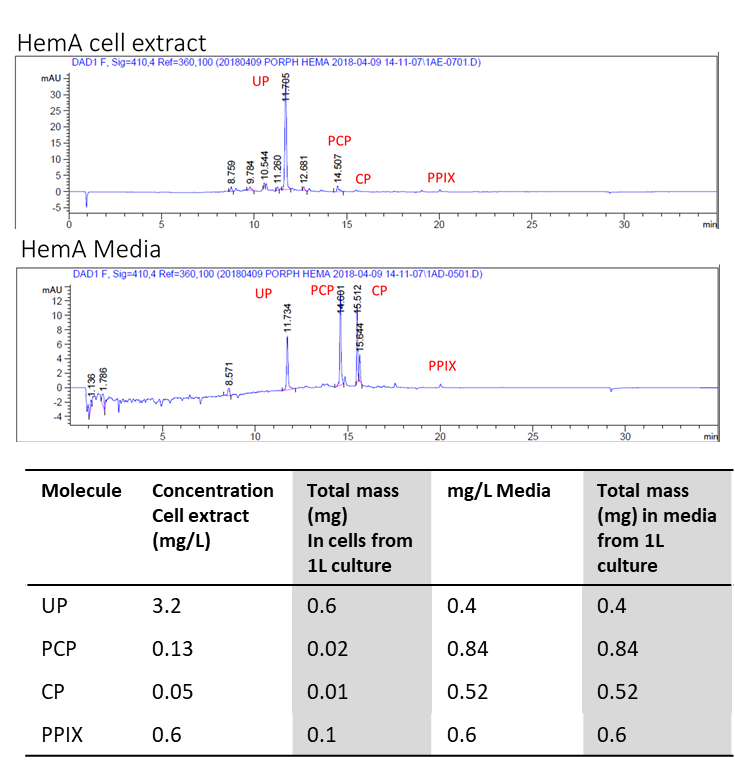
**Table S1.** Characteristics of Shemin pathway molecules

|  |  |  |  |
| --- | --- | --- | --- |
| **Molecule** | **Molecular weight** | **m/z** | **Retention time (min)** |
| **Uroporphyrin I and III (UP)** | 830.23 | 831.4 | 11.7 |
| **Pentacarboxyl porphyrin (PCP)** | 698.73 | 699.4 | 14.6 |
| **Coproporphyrin I and III (CP)** | 654.72 | 655.3 | 15.5 |
| **Protoporphyrin IX (PPIX)** | 562.67 | 563.4 | 20.5 |

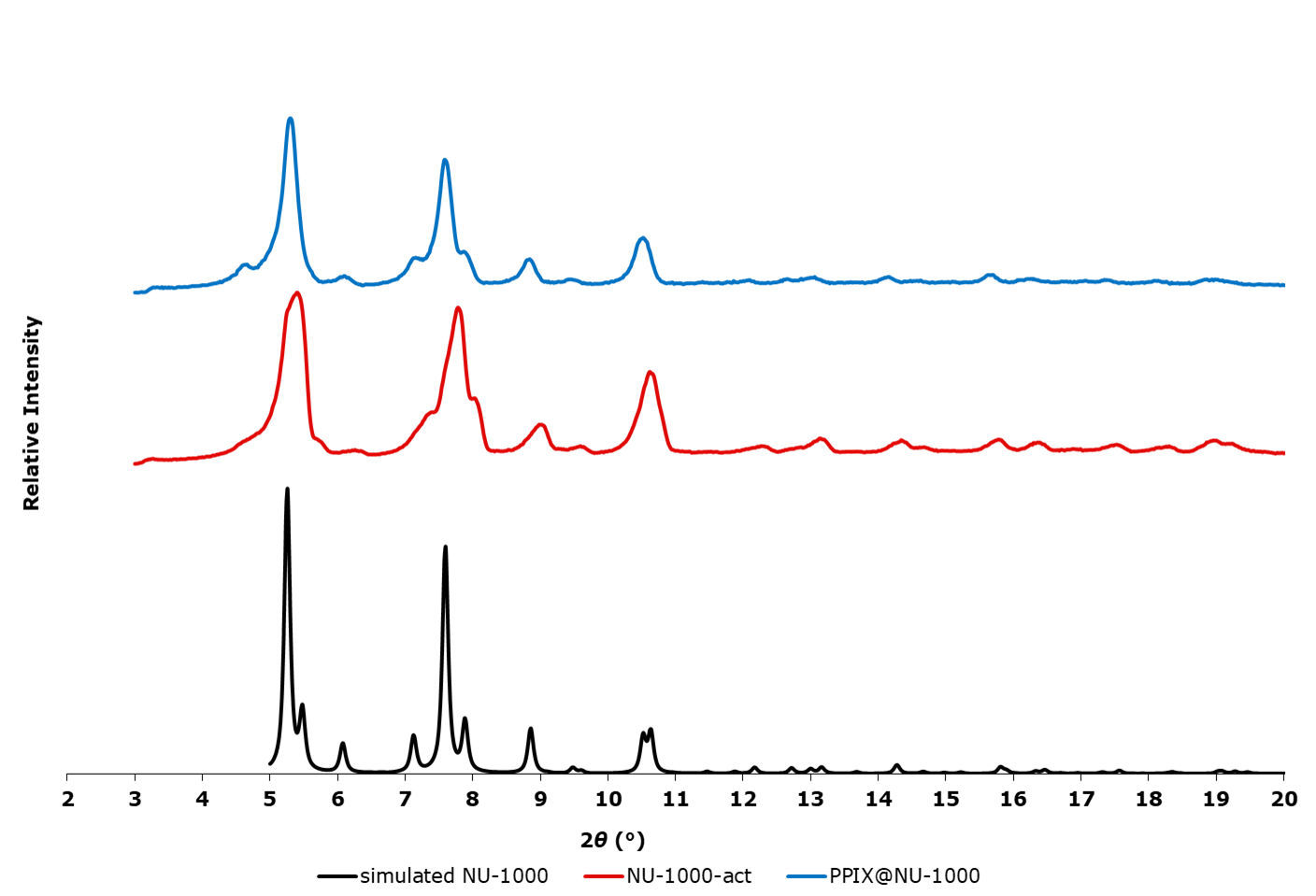
**Figure S2.** MSD signals for porphyrin standards



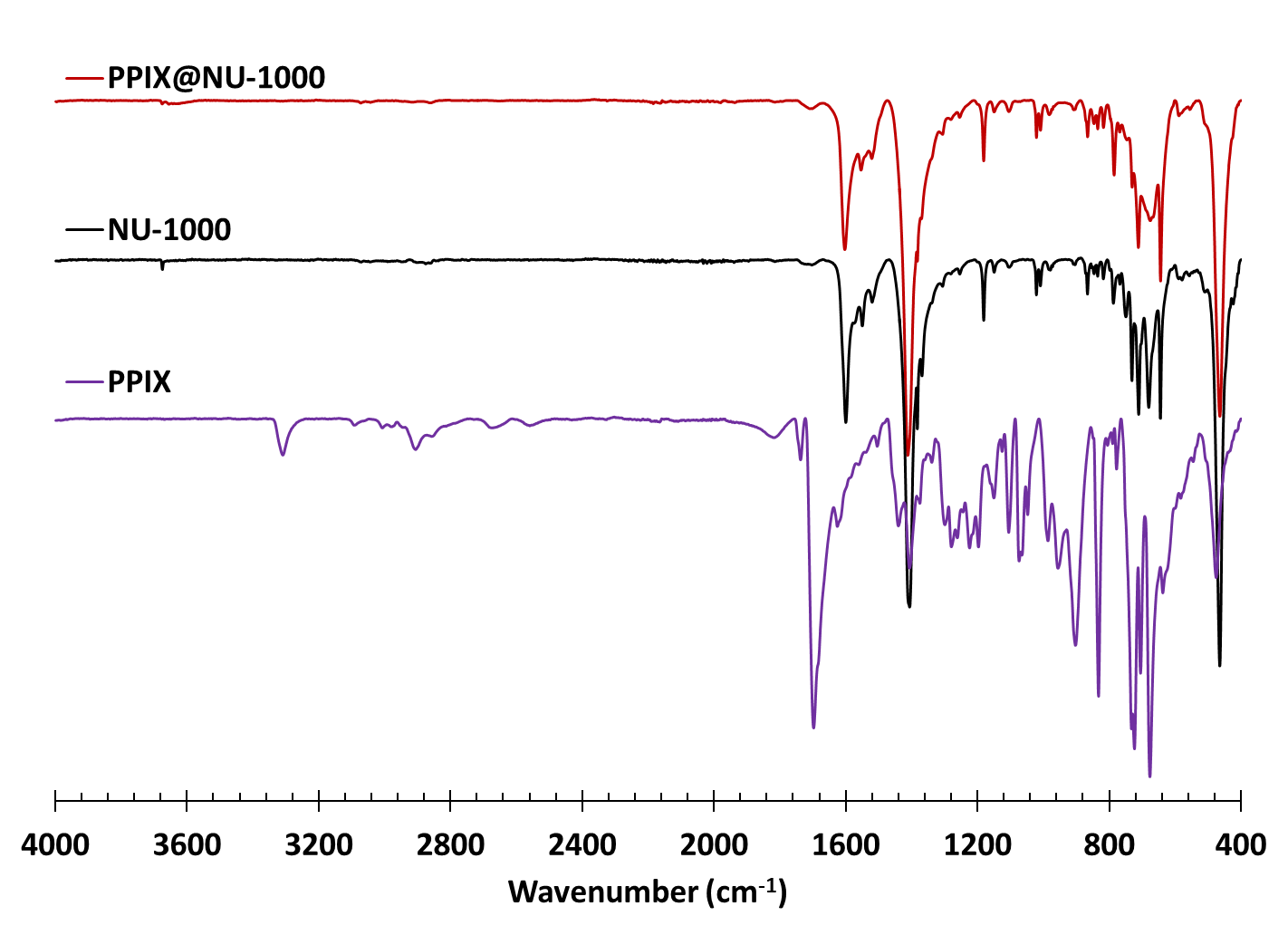
**Figure S3.** DAD traces and Quantification of porphyrins in media vs cell extract from 1L cultures of *E. coli* expressing the HemA protein.



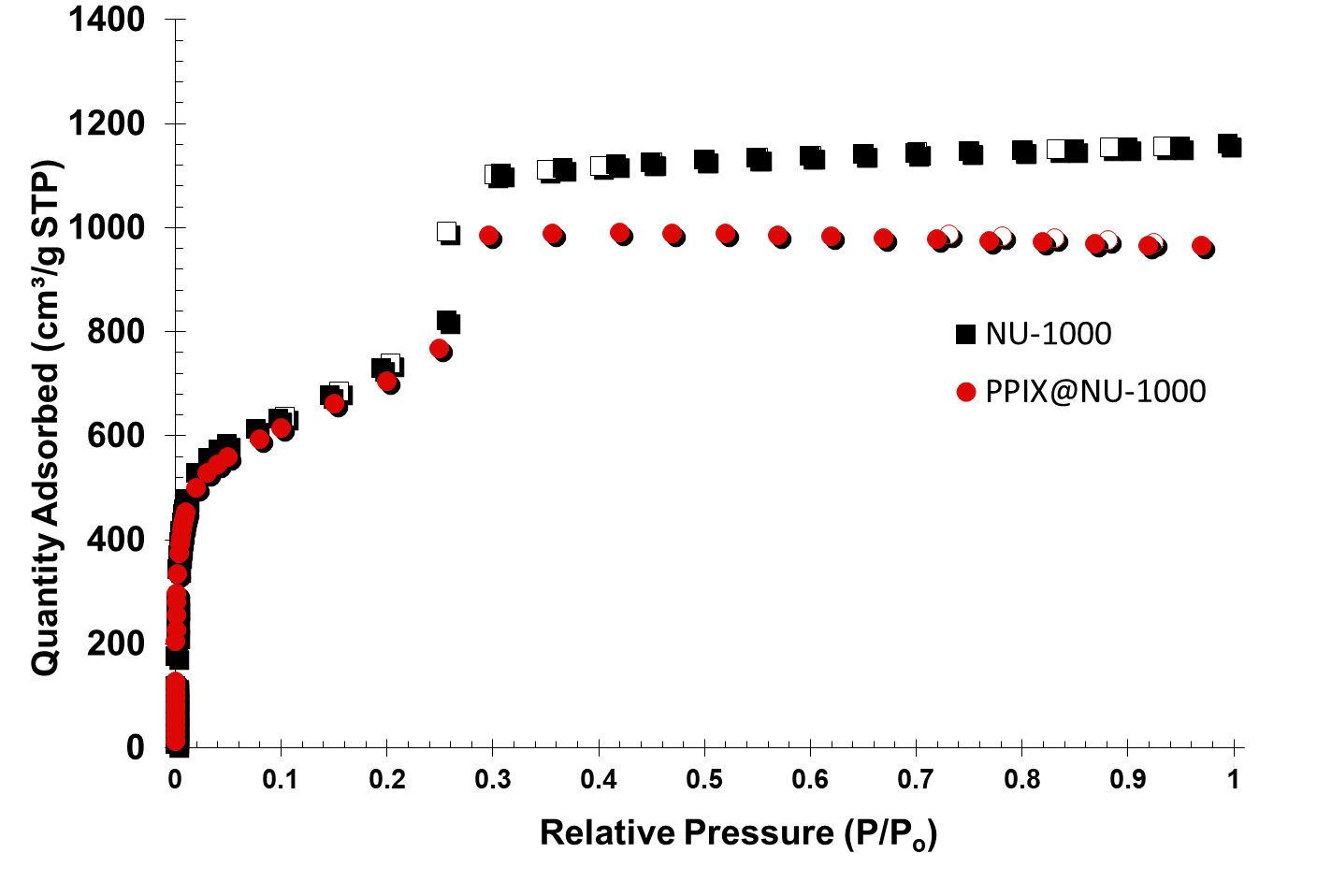
**Figure S4.** Powder X-ray diffraction patters of NU-1000 (bottom), and PPIX@NU-1000 (top).

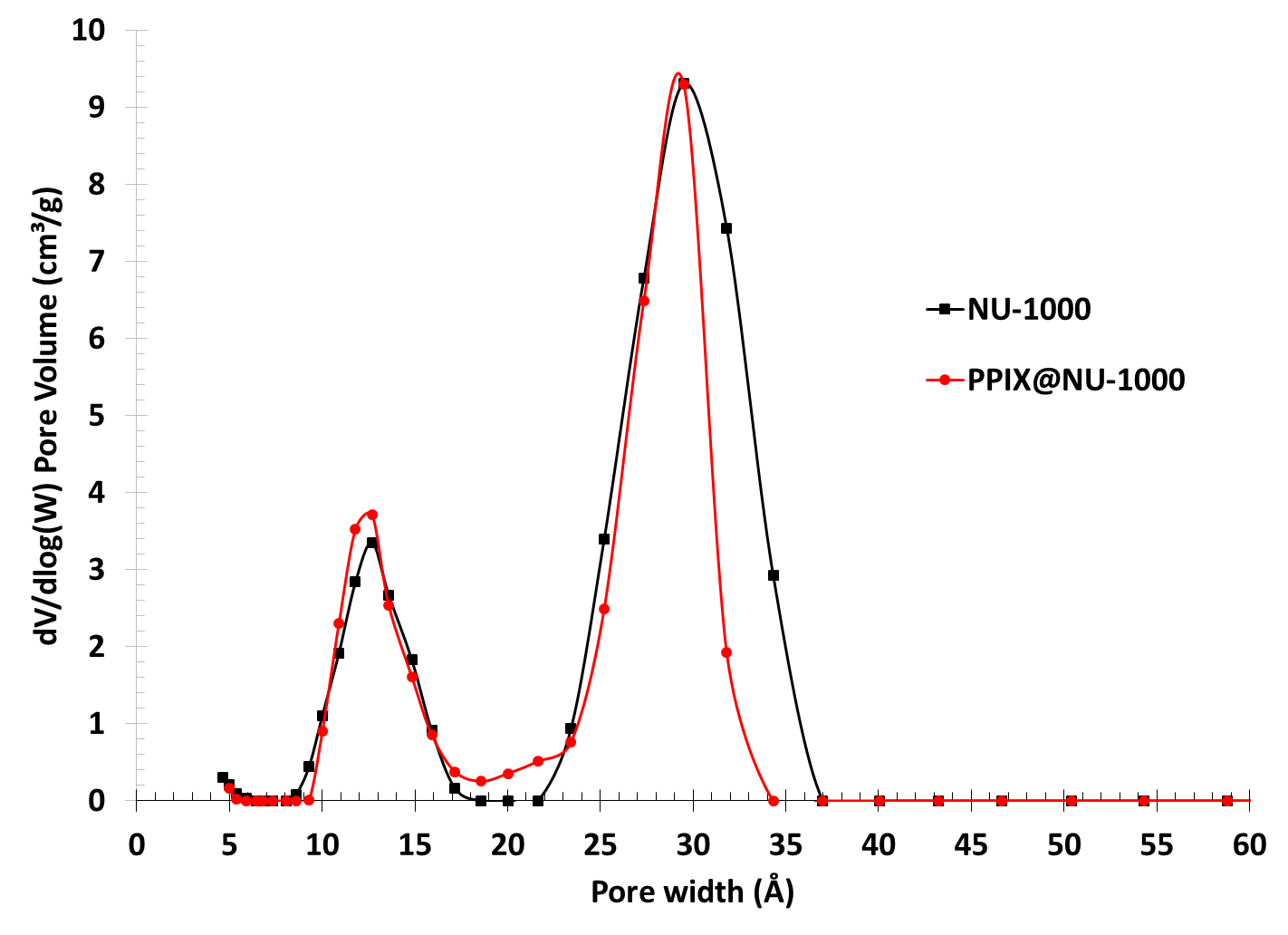
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**Figure S5.** FTIR of NU-1000, PPIX, and PPIX@NU-1000.

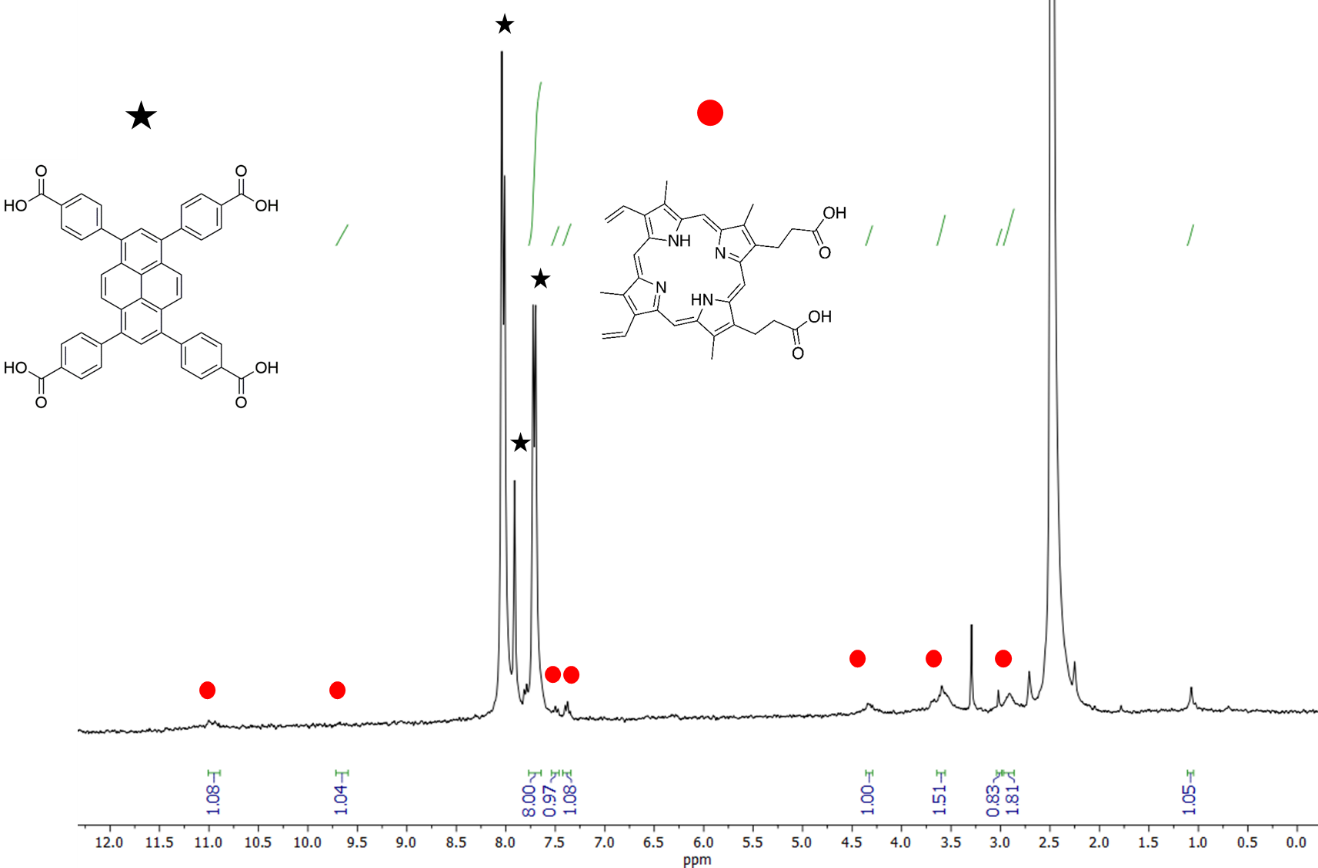


**Figure S6.** Nitrogen isotherms (top) and pore size distribution (bottom) of NU-1000 (black squares), and PPIX@NU-1000 (red circles). Adsorption = filled, desorption = empty markers.

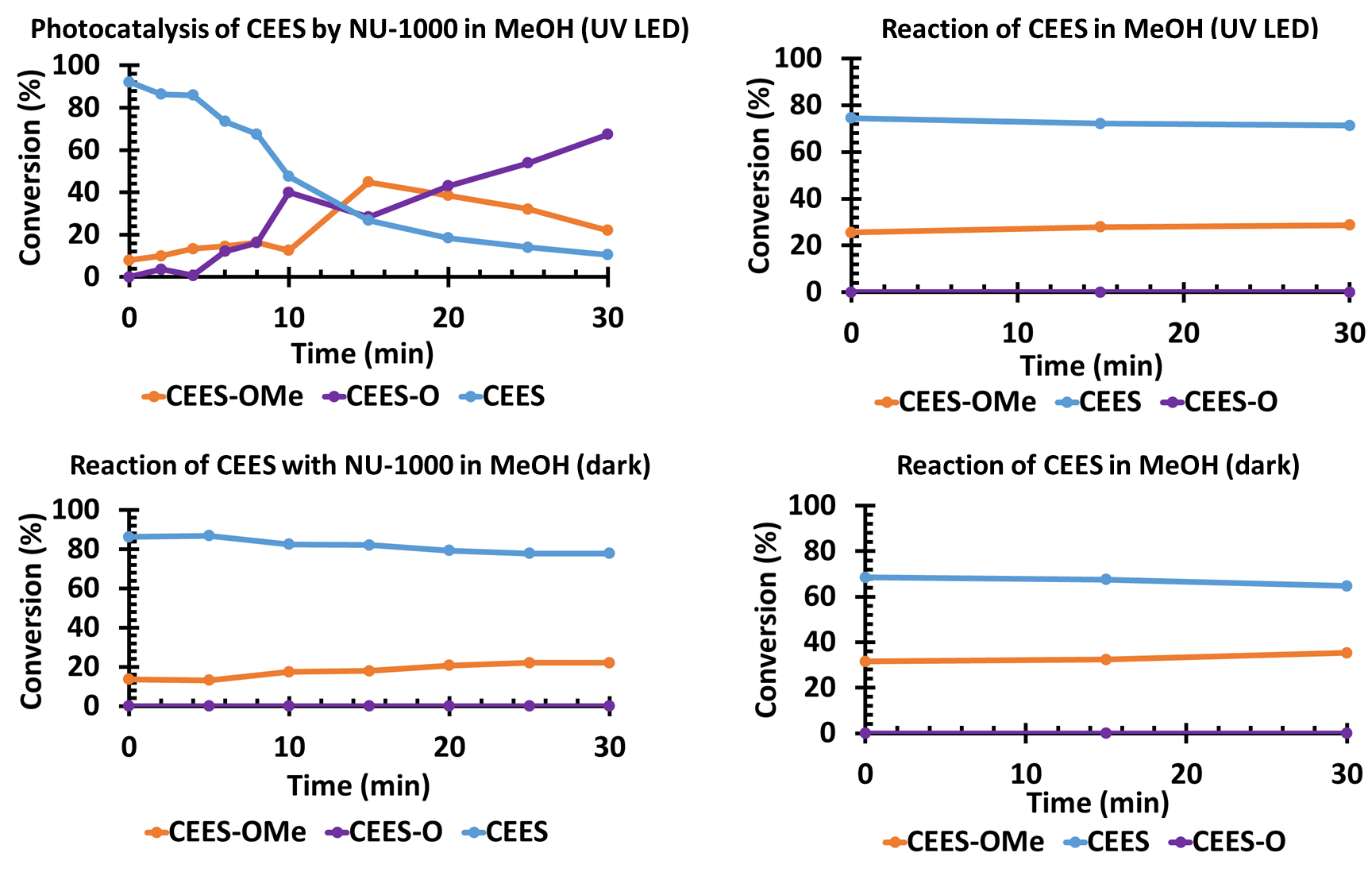
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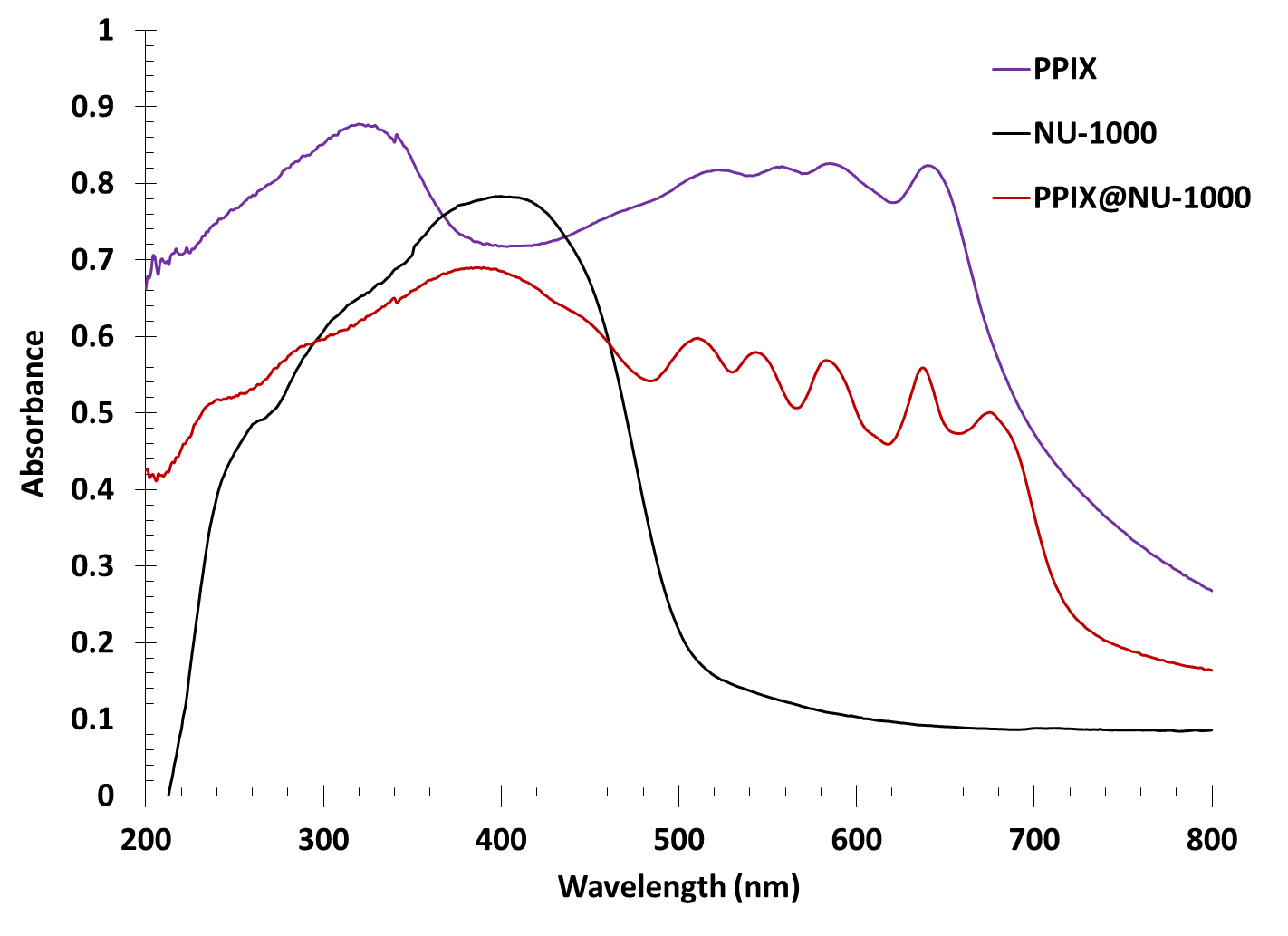
**Figure S7.** 1H NMR of digested PPIX@NU-1000.



**Figure S8.** Reaction of CEES in methanol under various control conditions.

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**Figure S9.** Solid state absorbance spectra of NU-1000, protoporphyrin IX, and PPIX@NU-1000. The H4TBAPy spectra and other insight into the electronic properties of H4TBAPy containing MOFs can be found elsewhere.1



**Table S2.** LED characteristics

|  |  |  |  |
| --- | --- | --- | --- |
| **LED Color** | **Minimum Dominant λ (nm)** | **Maximum Dominant λ (nm)** | **Minimum Luminous Flux (lm) @350 nm** |
| **Blue** | 465 | 480 | 35 |
| **Green** | 520 | 535 | 100 |
| **Red** | 620 | 630 | 70 |

\*Additional information about the colored LEDs can be found at http://menarilighting.com/rapidled/documentation/XLampXPE2.pdf and about the white LED at https://www.cree.com/led-components/media/documents/dsxpl2.pdf

**References**

1. Yu, J.; Park, J.,; Van Wyk, A.; Rumbles, G.; Deria, P. Excited-State Electronic Propertis in Zr-Based Metal-Organic Frameworks as a Function of a Topoligcal Network. *Journal of the American Chemical Society* **2018**, 140, 10488-10496. https://doi.org/10.1021/jacs8b04980.