

Enhancing Porphyrin Photostability When Locked in Metal-Organic Frameworks

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This section includes:

- Fourier-Transform Infrared Spectroscopy
- Fluorescent emission of TCPP-H₂ upon addition of incremental amounts of NaCl
- Quenching of TCPP-H₂ by Zr⁺⁴
- XRD of MOF-525 before and after photo excitation
- Representative single particle emission of MOF-525

I- Fourier-Transform Infrared Spectroscopy

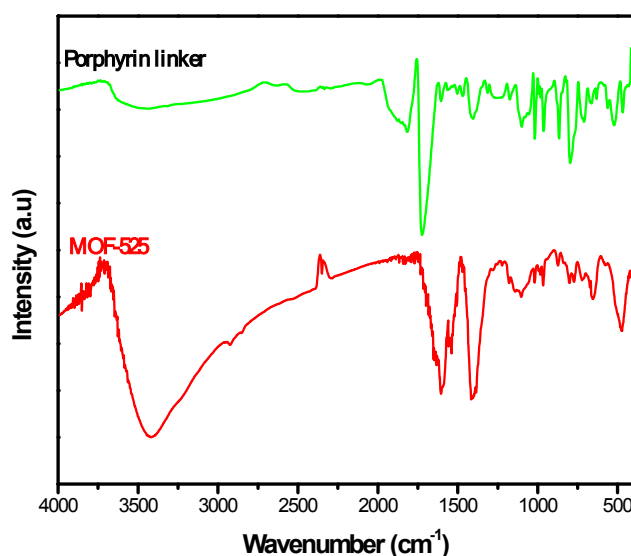


Figure S1: FTIR spectra recorded for the porphyrin linker and the prepared MOF-525

II- Fluorescent Response of TCPP-H₂ upon Addition of NaCl

Fluorescent intensity of TCPP-H₂ solution was recorded upon the addition of incremental amounts of NaCl solution. An enhancement in the recorded signal was observed with the increase of the solution ionic strength. At low ionic strength, we believe the TCPP-H₂ is aggregated which induces self-quenching.

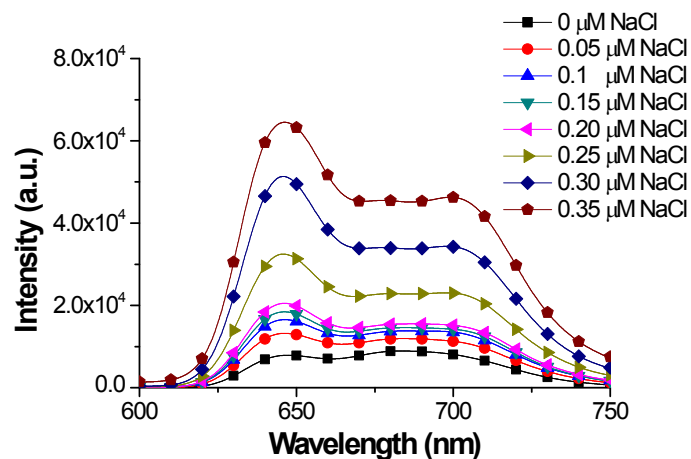


Figure S2: Fluorescent intensity of TCPP-H₂ upon adding incremental amounts of NaCl.

III- TCPP-H₂ Quenching by Zr⁺⁴ ions

With the self-assembly of porphyrin into higher ordered structures, a potential contributor to the quenching of TCPP-H₂ the Zr⁺⁴ ions which upon addition of incremental amounts of this metal ion, a decrease in the fluorescent signal was observed.

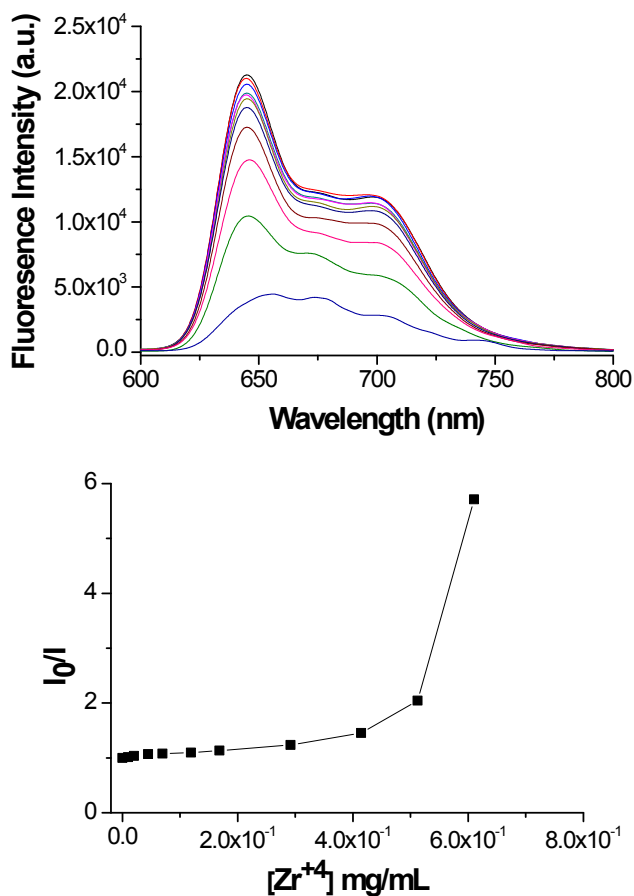


Figure S3: (A) Fluorescent quenching upon addition of incremental amounts of Zr⁺⁴ (B) Stern-Volmer plots of TCPP-H₂ derived from (A).

I- Absorbance

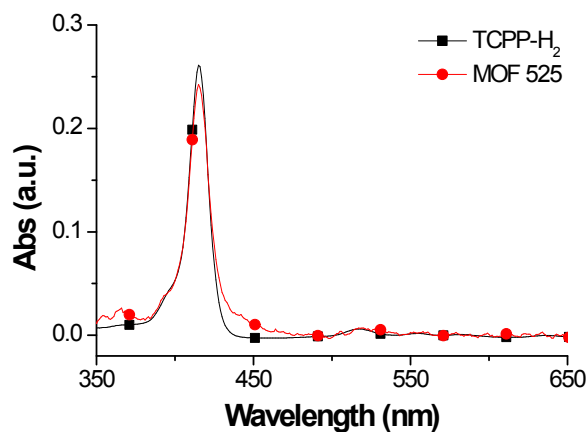


Figure S4: Absorbance spectra of optically matched aggregated porphyrin prepared in water ((■) TCPP-H₂) and porphyrin locked in a zirconium-based metal organic framework ((●) MOF-525) prepared at a final concentration at

II- Powder XRD

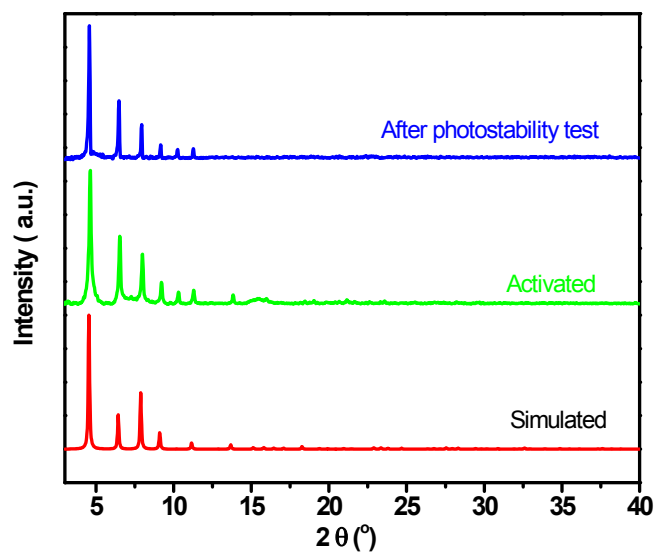
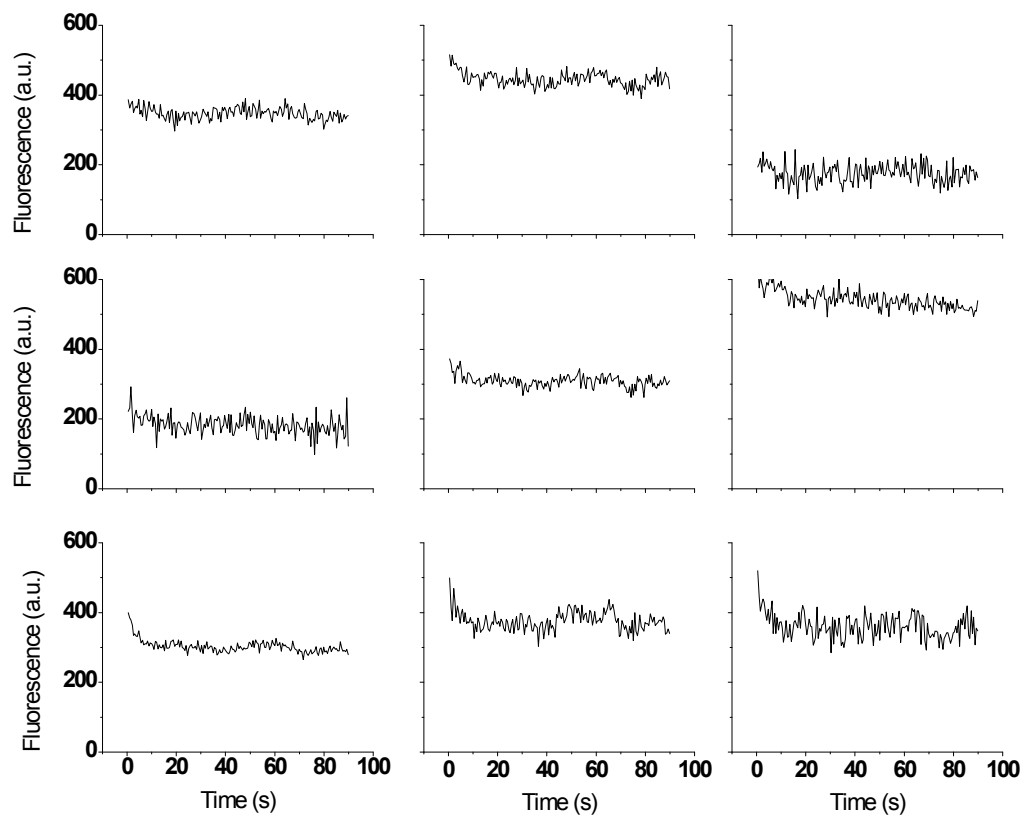


Figure S5: Powder XRD patterns of MOF-525 before and after photostability test.

Single Particle Traces:

No AntiFade



AntiFade

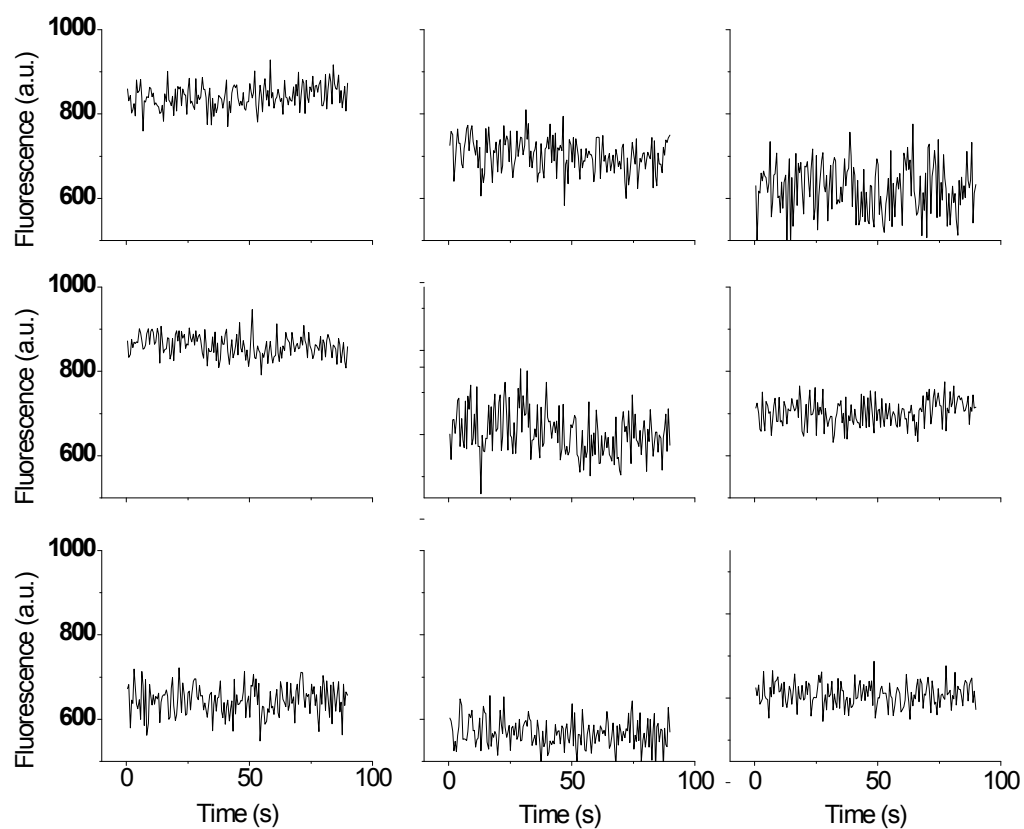


Figure S6: representative traces of fluorescent intensity-time traces of MOF-525 in the presence and absence of antifade.