Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.


# SUPPORTING INFORMATION

## Results

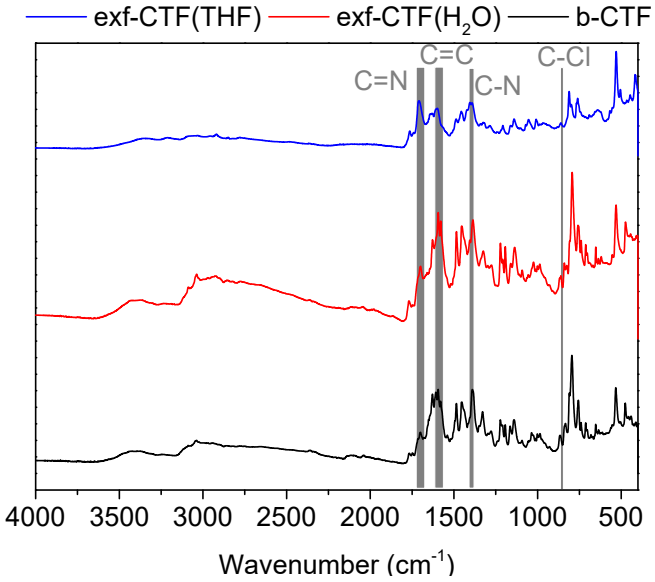


*Figure S1. FTIR spectra of the final bulk covalent triazine frameworks after the nucleophilic substitution and after its exfoliation in $H_2O$ and THF*

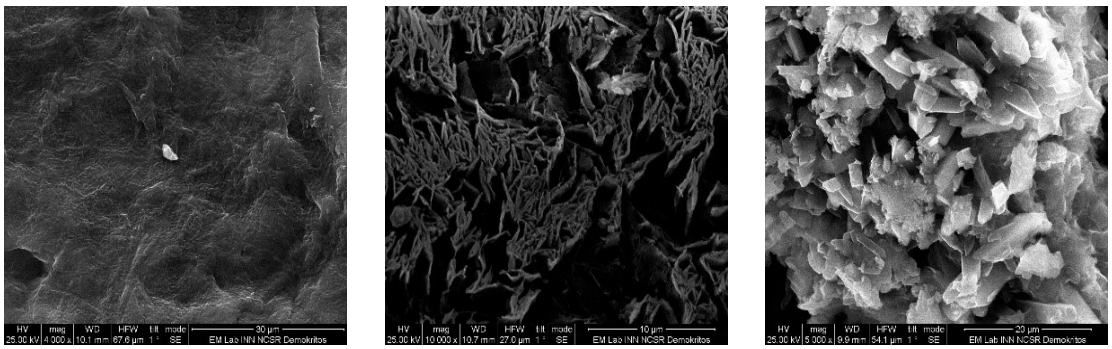

*Figure S2. SEM images of a) b-CTF(from Toluene), its exfoliated forms in $H_2O$ (b) and rearrangement in THF (c)*

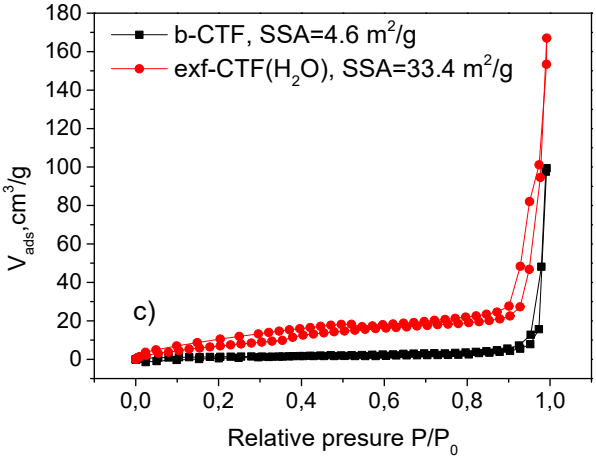


*Figure S3 $N_2$ adsorption/desorption isotherm profile and SSA values of b-CTF and exfoliated exf-CTF($H_2O$)*

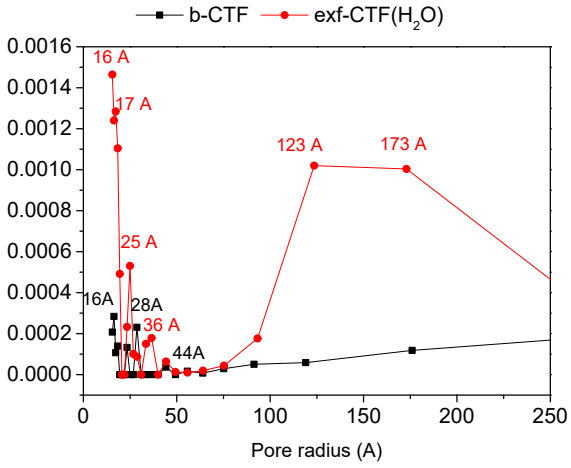


*Figure S4. BJH pore size distribution of b-CTF and exfoliated CTF in $H_2O$*

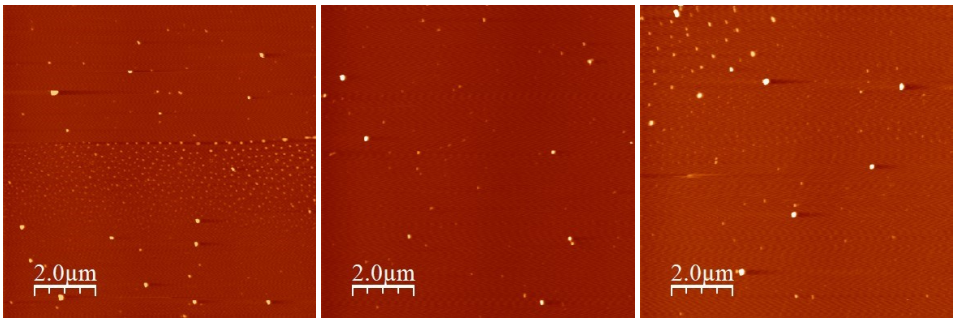


*Figure S5. Three different areas captured by atomic force microscopy of spin coated 5.59 $10^{-5}$ M b-CTF deposited on Si wafer (vertical scale : 40 nm)*

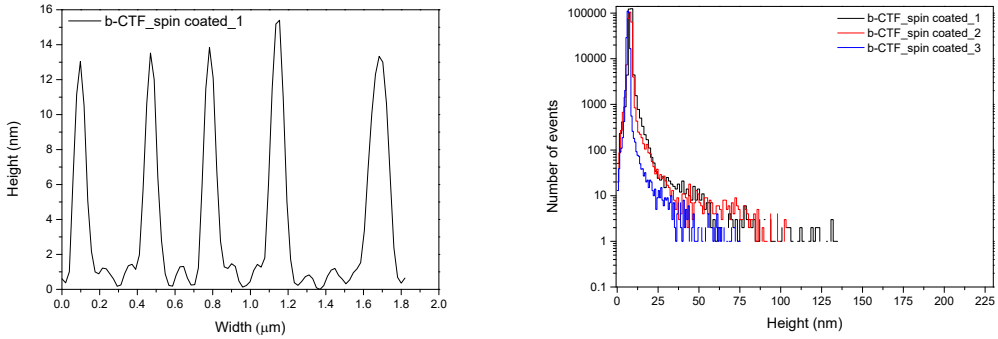


*Figure S6. 2D-Profile of a region at b-CTF_spincaoted_1 to the right and the histograms of the 2 μm areas captured at spin coated b-CTF aqueous dispersion to the left*

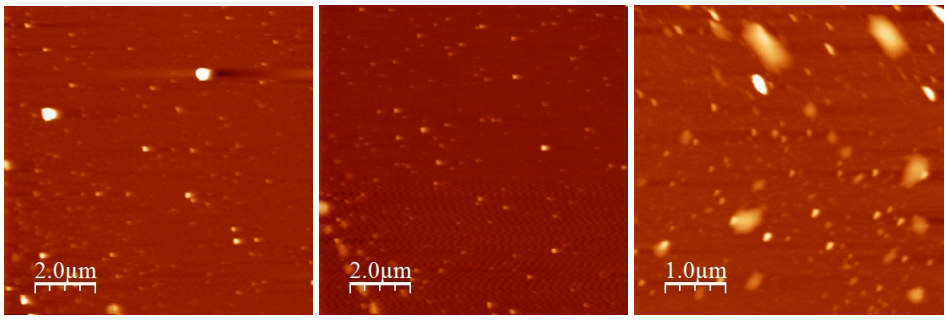


*Figure S7. Three different areas captured by atomic force microscopy of spin coated 5.59 $10^{-6}$ M b-CTF irradiated for 2 minutes under UV light (vertical scale : 60nm)*

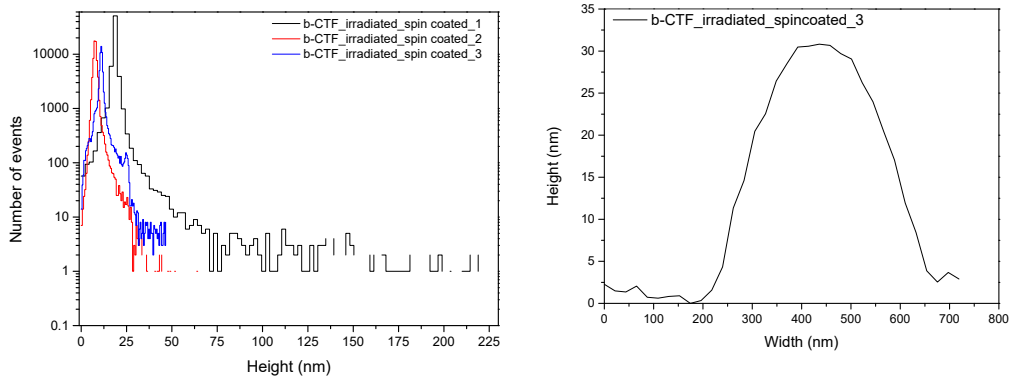


*Figure S8. The histograms of the 2 μm areas captured at spin coated b-CTF_ irradiated aqueous dispersion (left) and to the right a 2D-Profile of a region at b-CTF_irradiated_spincaoted_1*

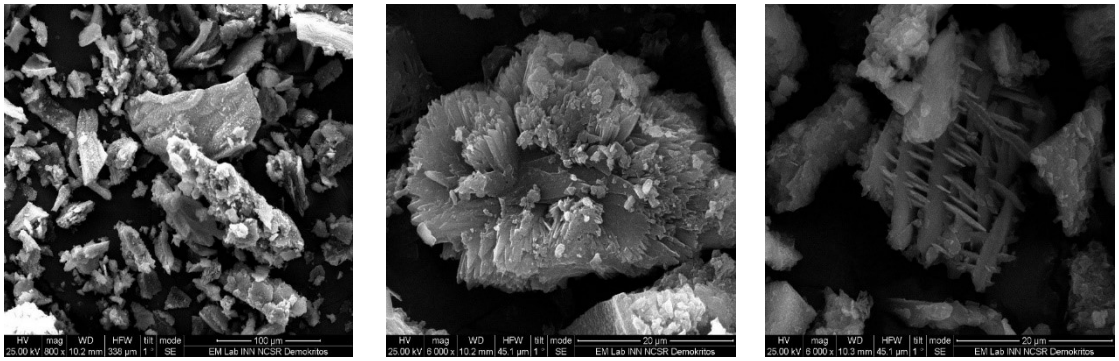

*Figure S9. SEM images of b-CTF irradiated in an aqueous dispersion.*

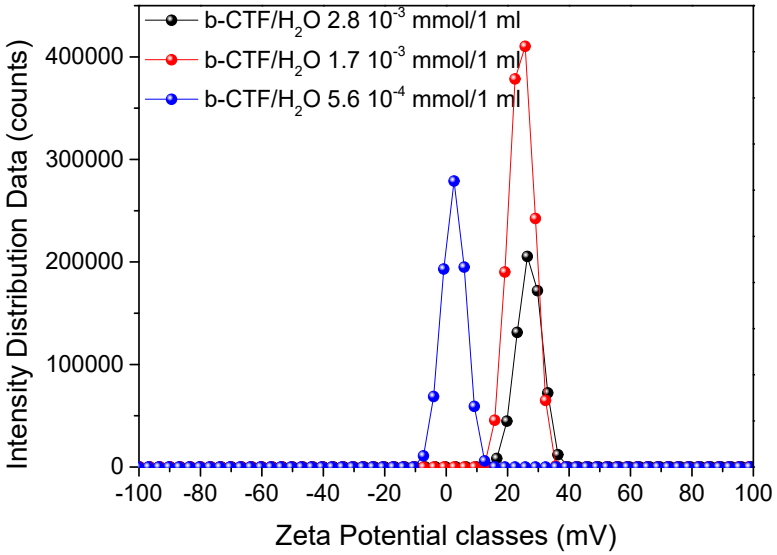


*Figure S10. Zeta potential measurements in three different concentrations of b-CTF/$H_2O$*

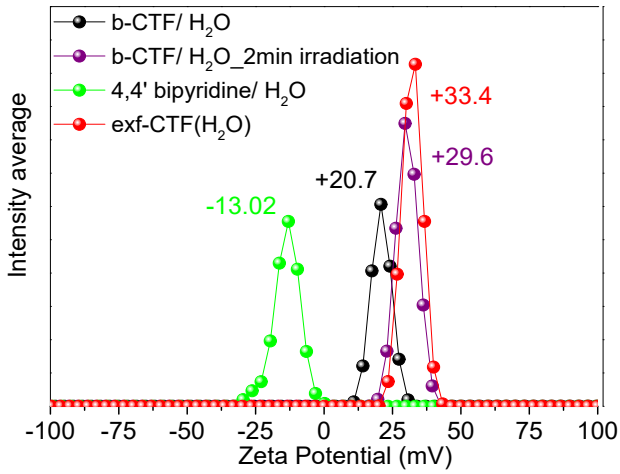


*Figure S11. Dynamic light scattering of 4,4 bipyridine in $H_2O$, b-CTF/$H_2O$, b-CTF/$H_2O$ UV-irradiated 2 min and exf-CTF($H_2O$)*

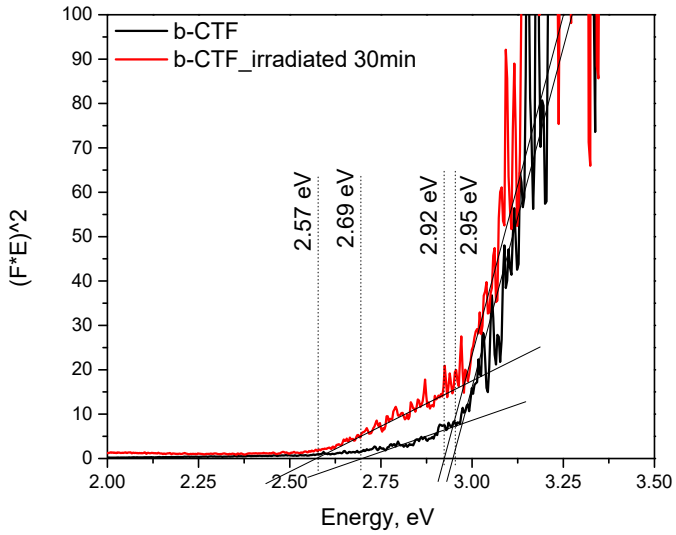


*Figure S12. Direct energy gap before and after UV irradiation of the b-CTF powder and the new intermediate states created from the irradiation*

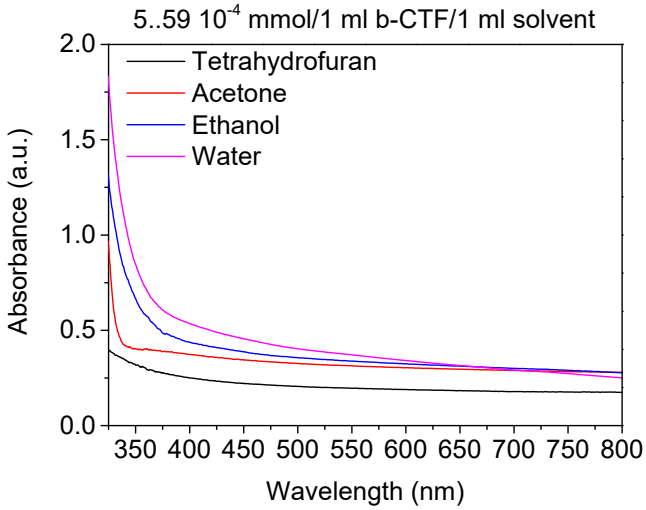


*Figure S13. Solvatochromic effect of b-CTF in different solvents at the stable concentration of 5.59 $10^{-4}$ M.*

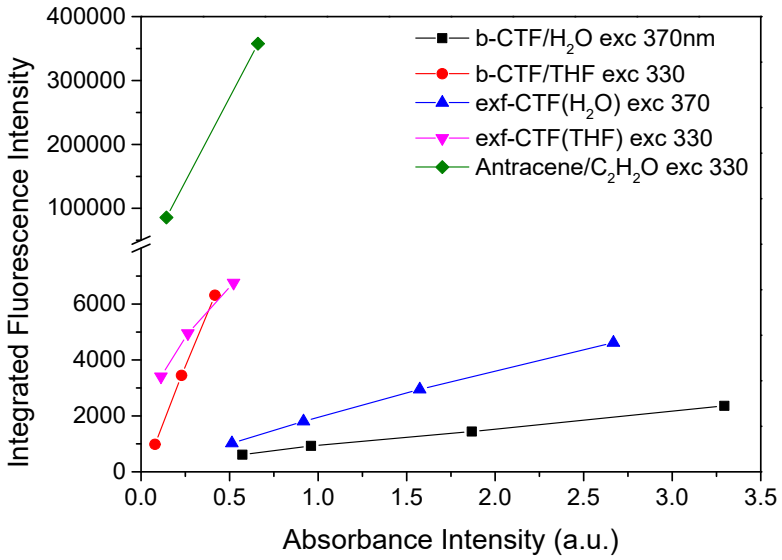


*Figure S14. Intensity-absorbance curve of the b-CTF in THF and $H_2O$ dispersions, exf-CTF($H_2O$) and exf-CTF(THF)solutions in comparison with $C_{14}H_{10}$ in $C_2H_6O$ for quantum yield measurements*

*Table S1. Results of linear fit and quantum yield calculations of the b-CTF dispersed in THF and $H_2O$ and exf-CTF in $H_2O$ and in THF*

| | y=a+b*x | Error | $R^2$ | Quantum yield |
|---|---|---|---|---|
| Anthracene / $C_2H_6O$ | b=525937.33 | - | - | 0.27 |
| b-CTF / $H_2O$ | b=631.23 | 17.7 | 0.99764 | $3.11 \cdot 10^{-4}$ |
| b-CTF / THF | b=14885.93 | 482.5 | 0.99686 | $8.2 \cdot 10^{-3}$ |
| exf-CTF($H_2O$) | b=1658.24 | 57.8 | 0.99636 | $8.16 \cdot 10^{-4}$ |
| exf-CTF(THF) | b=2624.56 | 835.5 | 0.97864 | $4.40 \cdot 10^{-3}$ |

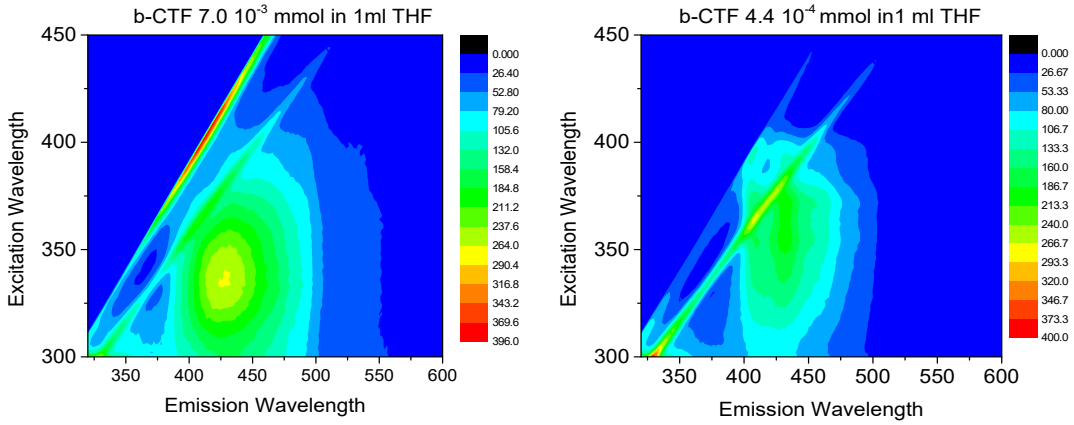


*Figure S15. Fluorescence dependence of b-CTFs' concentration in THF*

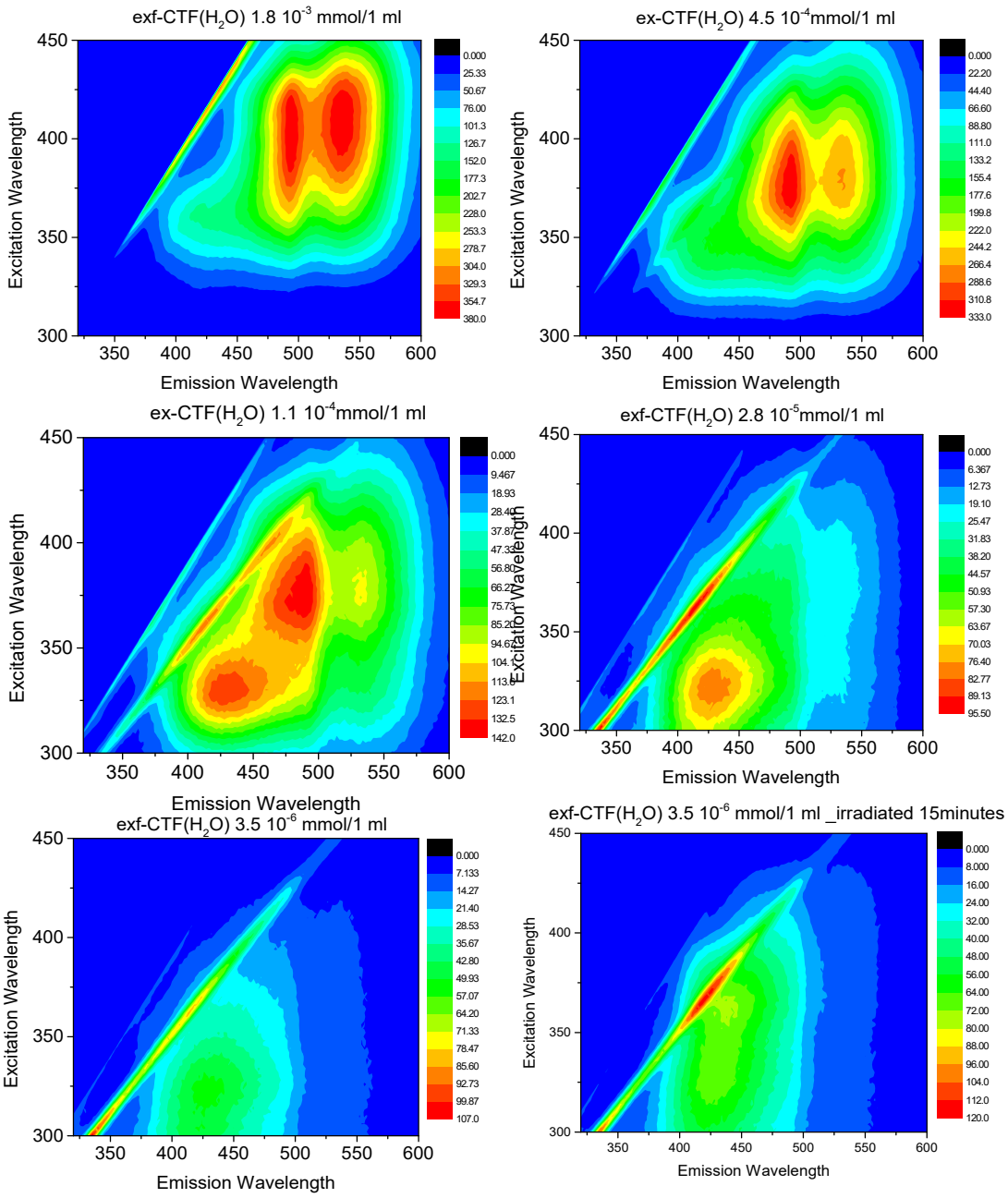


*Figure S16. Fluorescence dependence on concentration of the exf-CTF in $H_2O$.*

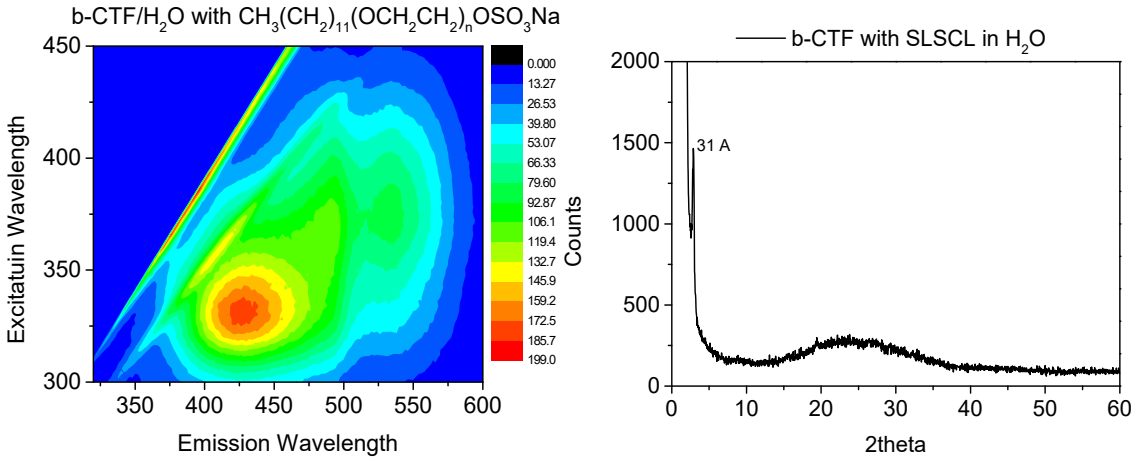


*Figure S17. Fluorescence mapping of the 5.6 $10^{4}$M b-CTF aqueous dispersion with the addition of sodium lauryl sulfate and its X-ray diffraction pattern.*

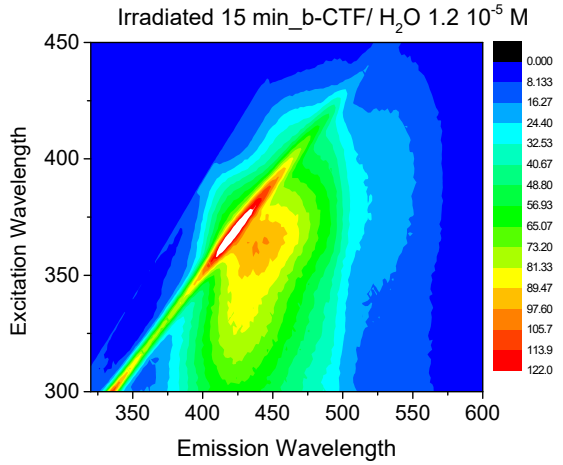


*Figure S18 Excitation dependent fluorescence mapping of 1.2 $10^{-5}$ M b-CTF/$H_2O$ after 15 min under UV irradiation*

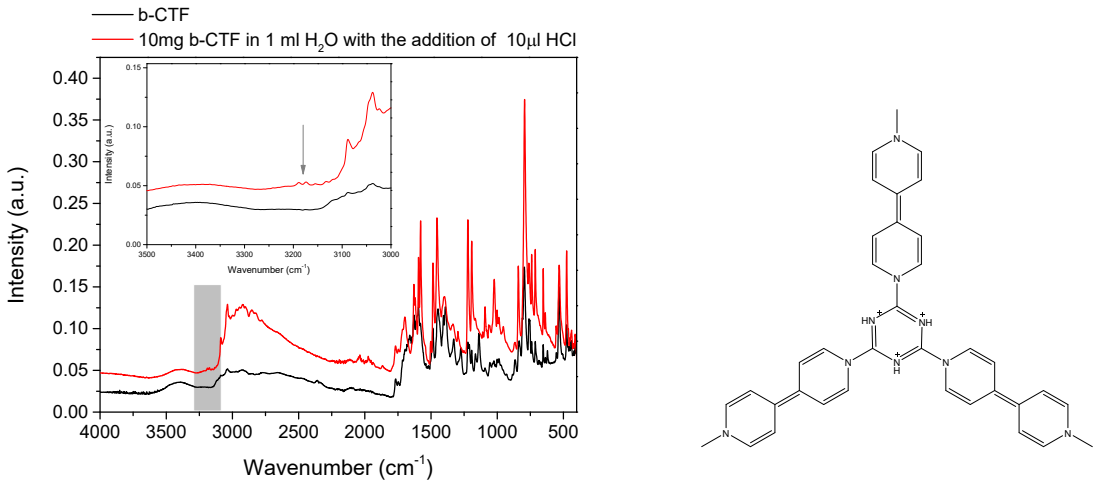


*Figure S19. FTIR spectra before and after the protonation of the networks with HCl. The spectra are indicating the symmetric and antisymmetric vibration modes of N-H bonds, after protonation of the nitrogen of the central triazine unit and terminal pyridine groups. The area corresponding to a protonated nitrogen is shown as an inset.*

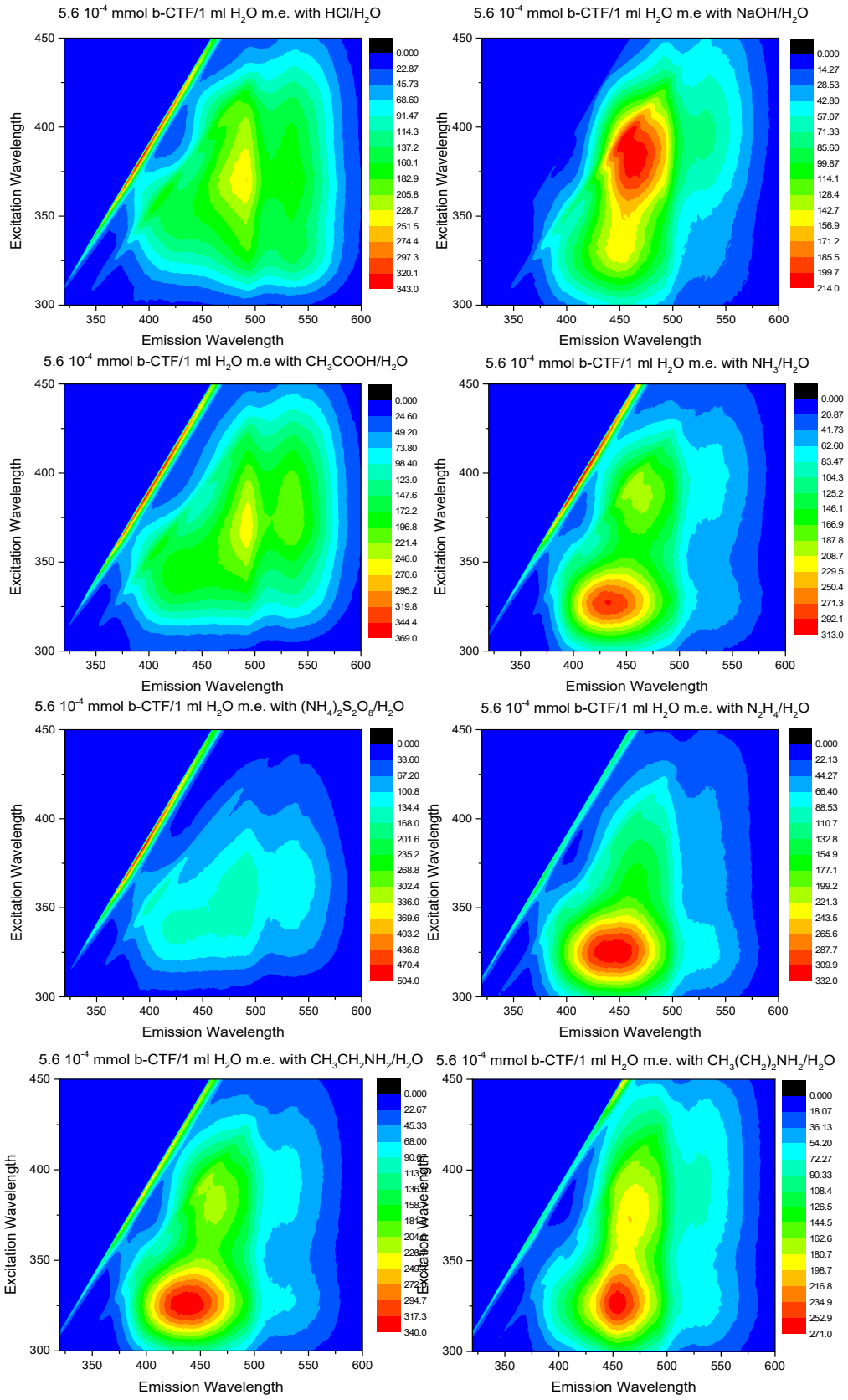


*Figure S20. Fluorescence mapping of additions in molecular equivalence with 5.6 $10^{-4}$ mmol b-CTF in 1 ml aqueous dispersions*

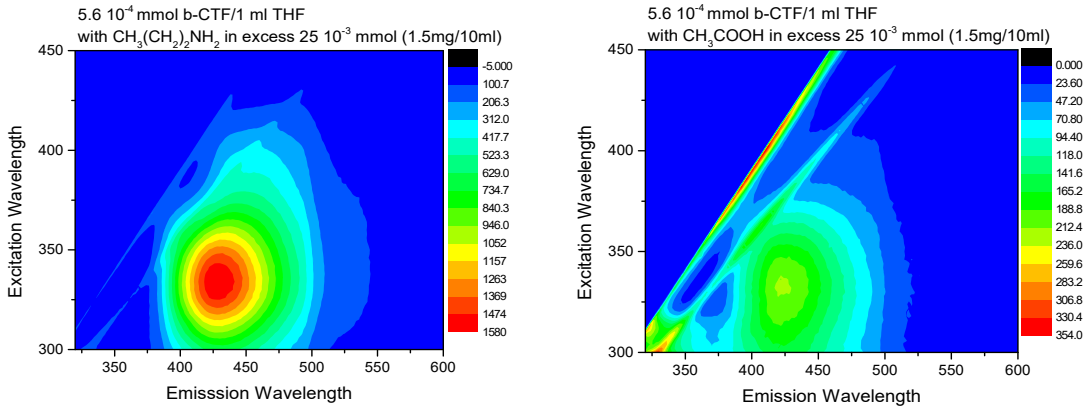


*Figure S21. Addition of weak base and acid in mass equivalence with b-CTF in THF*

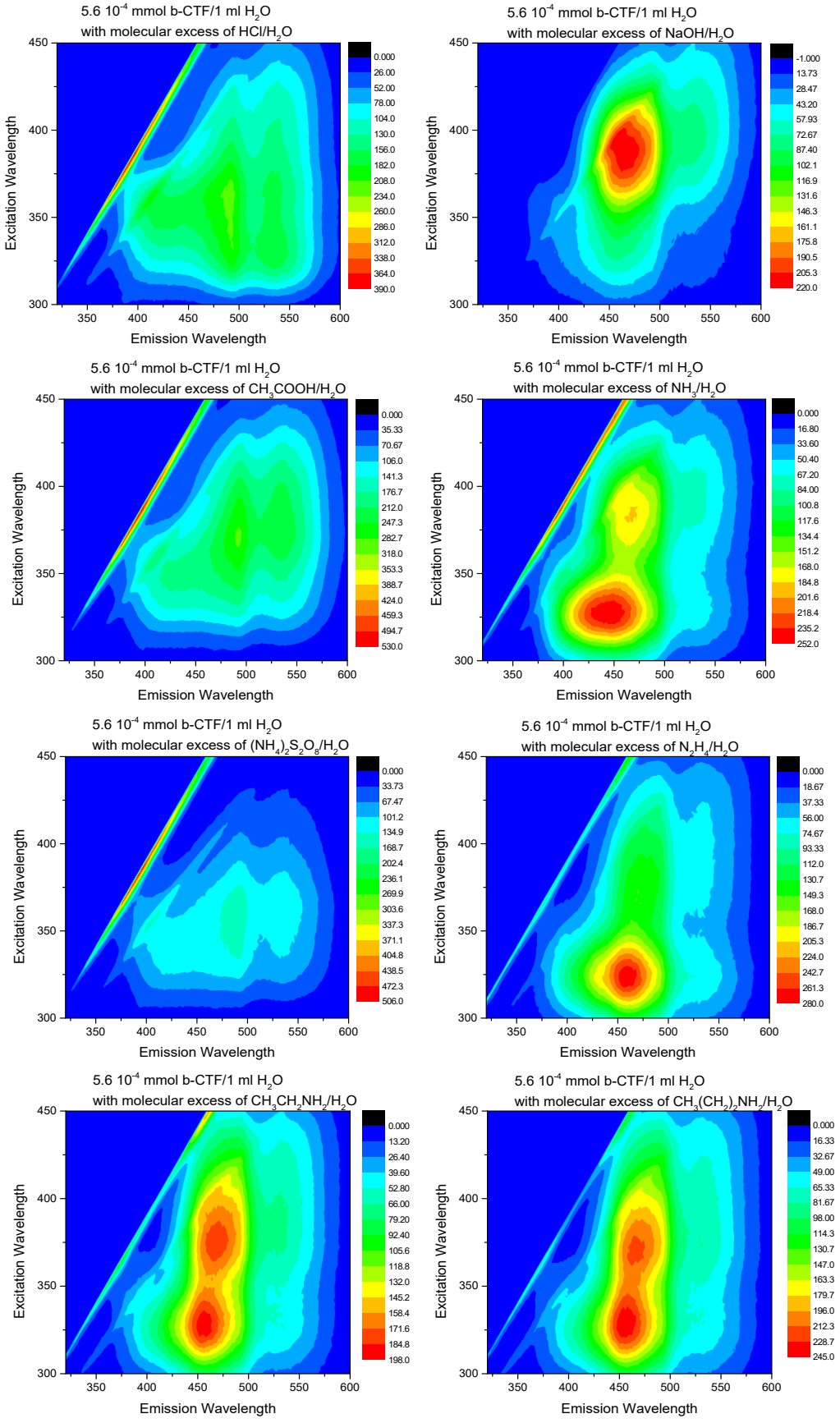


*Figure S22. Fluorescence mapping of additions in molecular excess(x10times) with 5.6 $10^{-4}$mmol b-CTF in 1 ml aqueous dispersions*

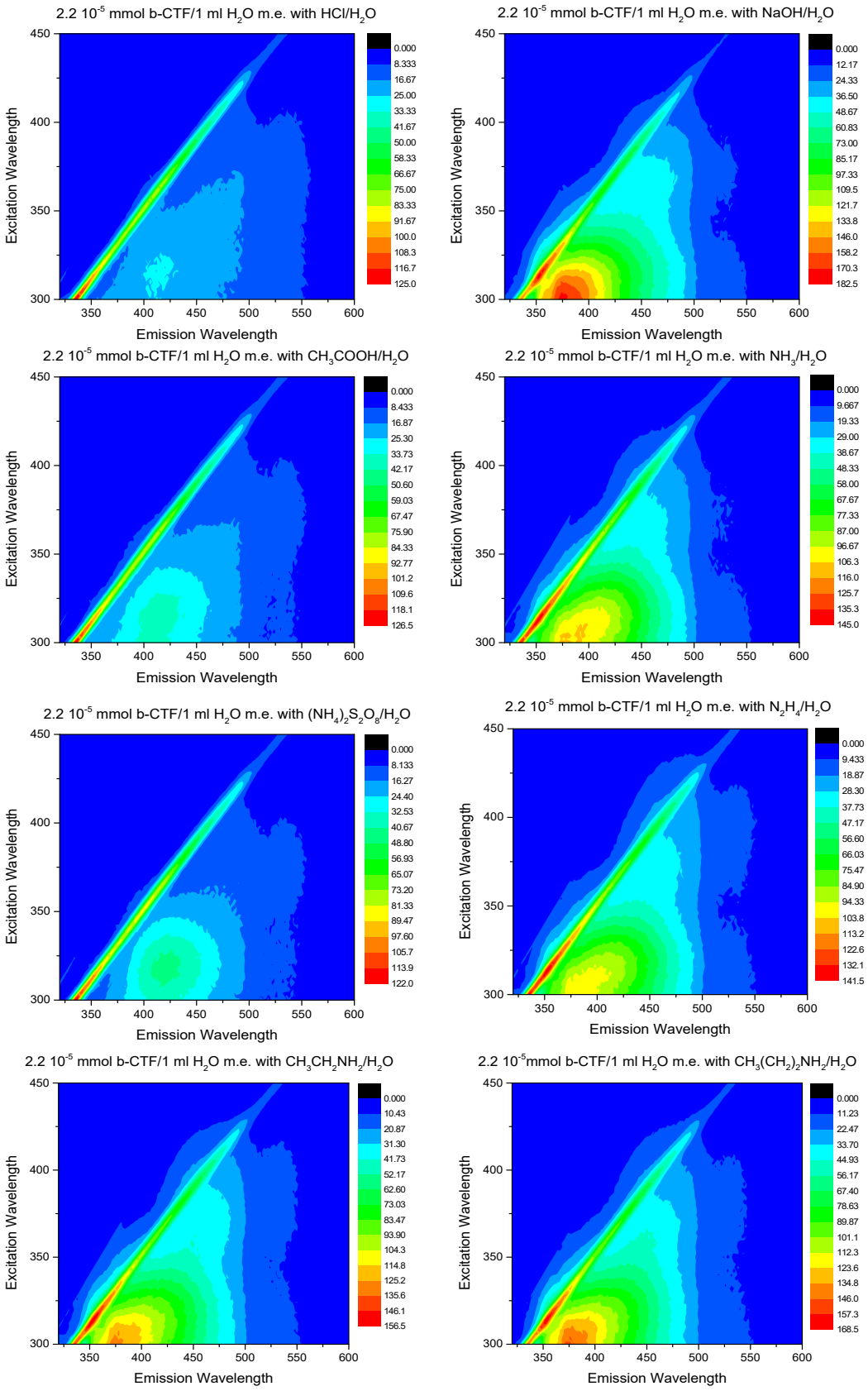


*Figure S23. Fluorescence mapping of additions in molecular equivalence with 2.2 $10^{-5}$ mmol b-CTF in 1 ml aqueous dispersions*

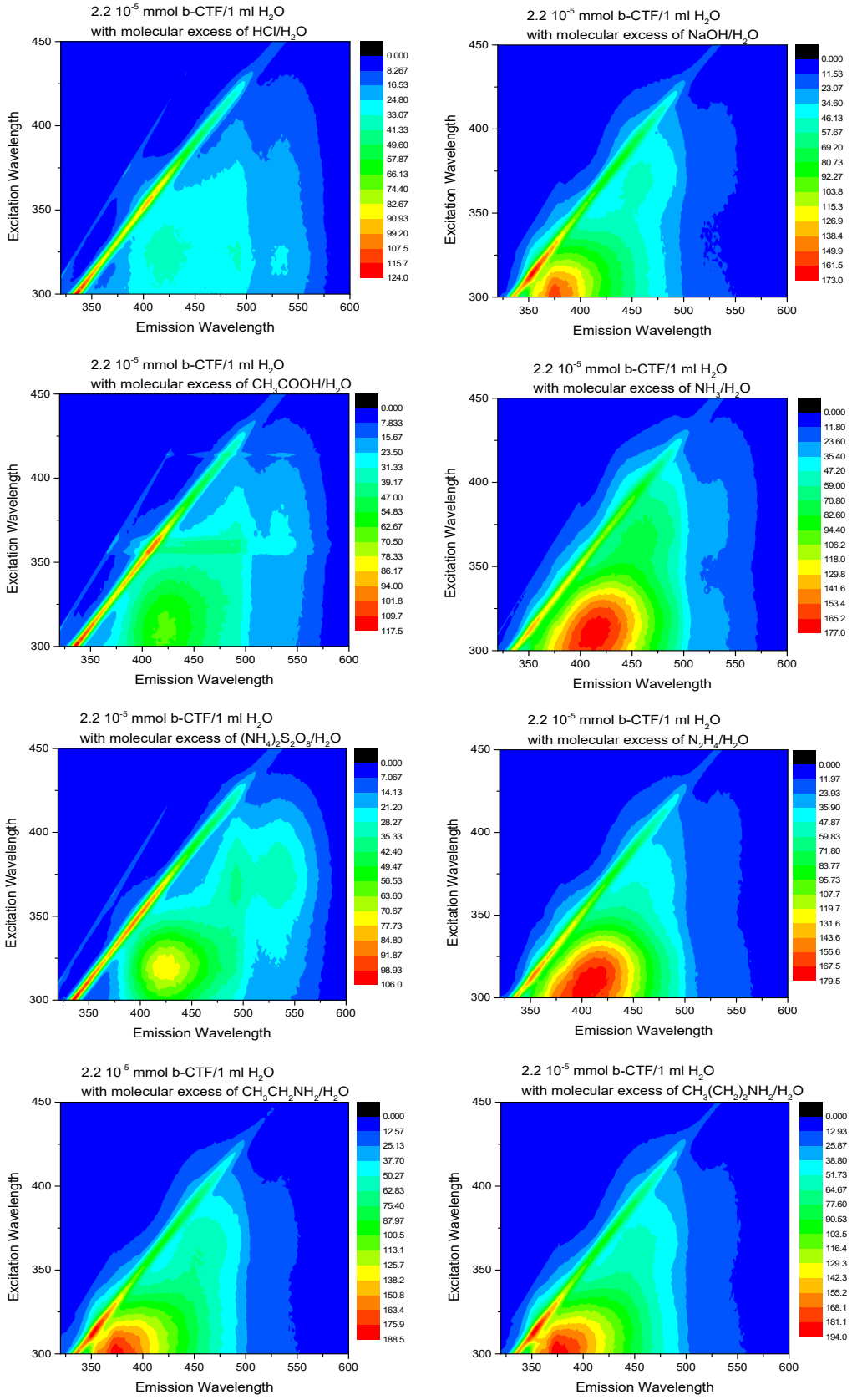


*Figure S24. Fluorescence mapping of additions in molecular excess with 2.2 $10^{-5}$ mmol b-CTF in 1 ml aqua dispersions*

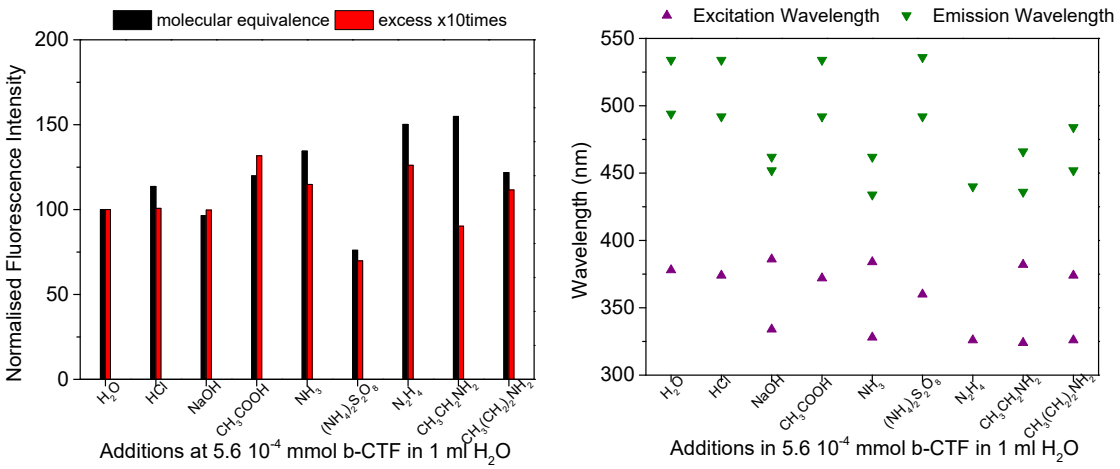


*Figure S25. Fluorescence response chart depending on the added reagent and the provoked changes at the maximum intensity of the b-CTF. The concentration was 5.9 $10^{-4}$ M and the excitation and emission positions obtained by the 3D fluorescence mapping after the additions.*

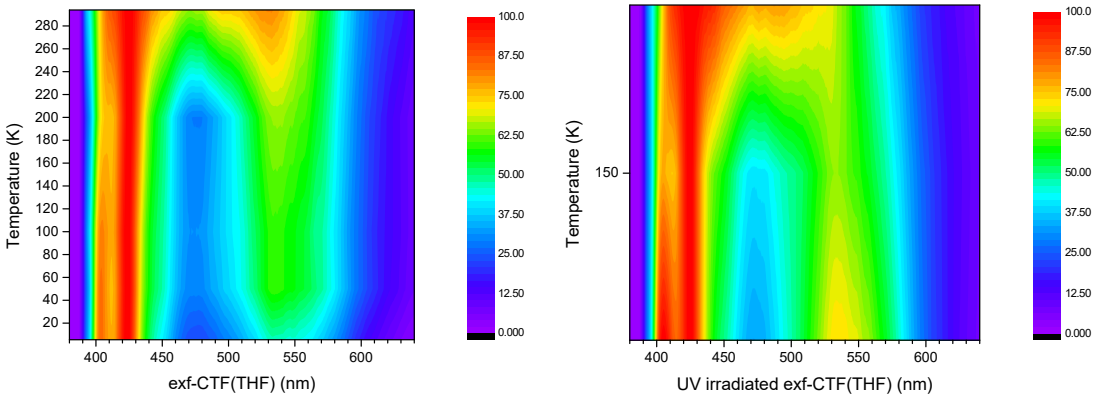


*Figure S26. Heat maps of the exf-CTF(THF) emission depending on the temperature, before and after irradiation of 30min*