materials

MDPI

Supporting information

Reversible Aggregation of Molecular-Like Fluorophores Driven by Extreme PH in Carbon Dots

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Received: 1 July 2020; Accepted: 13 August 2020; Published: date

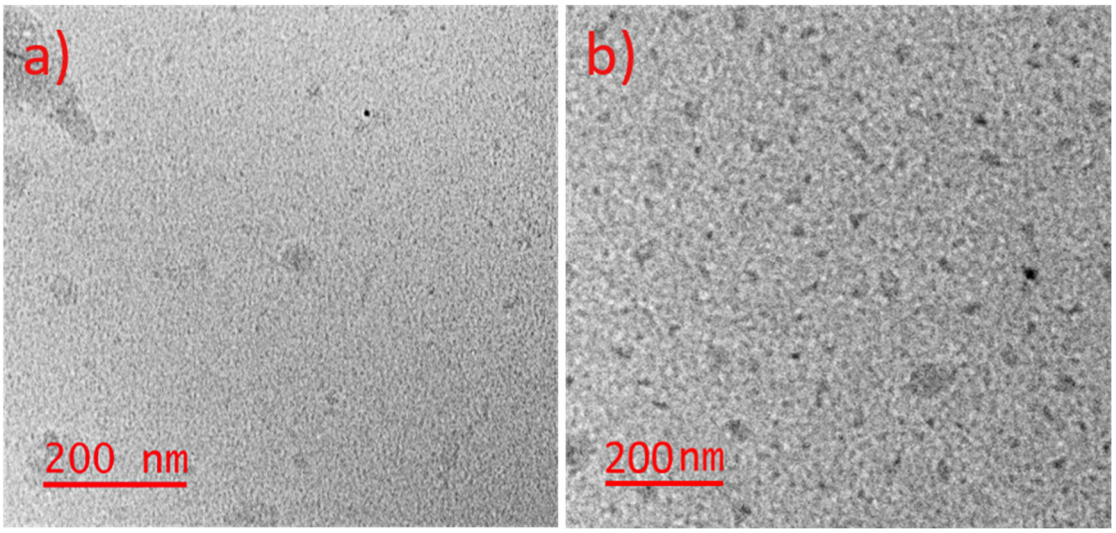


Figure S1. Representative TEM images of (**a**) CU2 and (**b**) CU25.

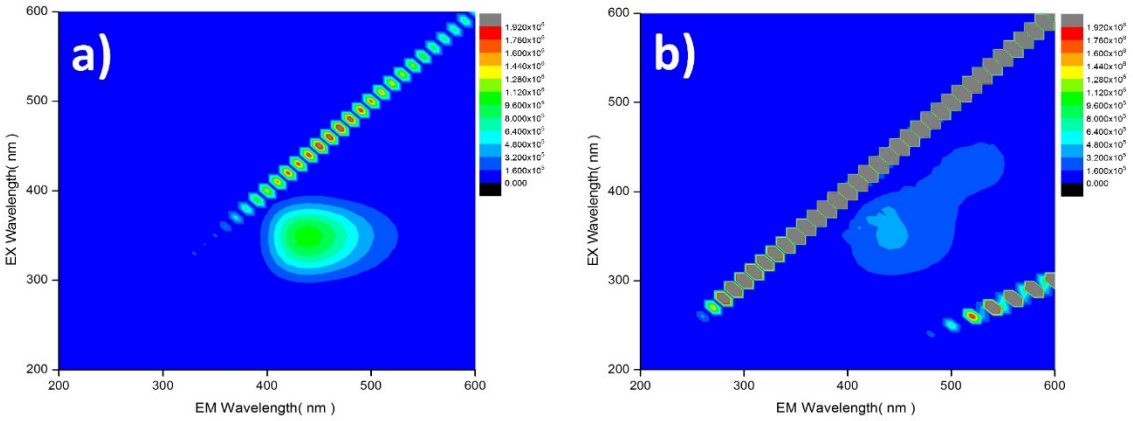


Figure S2. 3D photoluminescence spectra (excitation (y-axis), emission (x-axis), intensity (false colors scale)) of citrazinic acid (**a**) in water and (**b**) in H_2SO_4 10% at concentration of 10 mg L^{-1}.

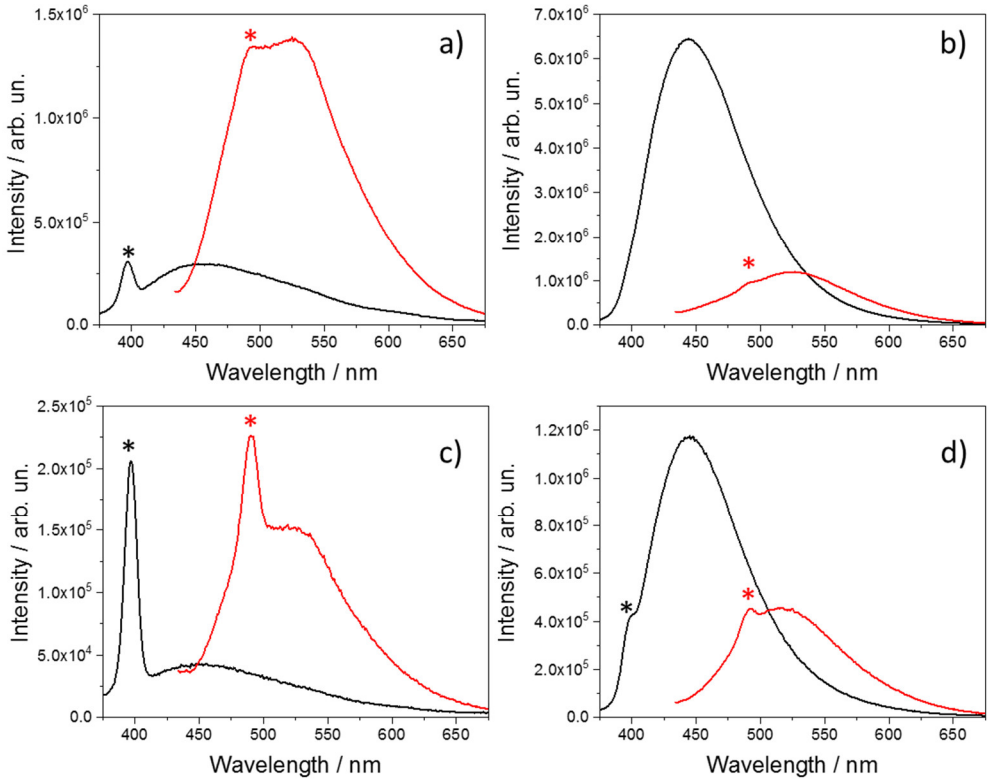
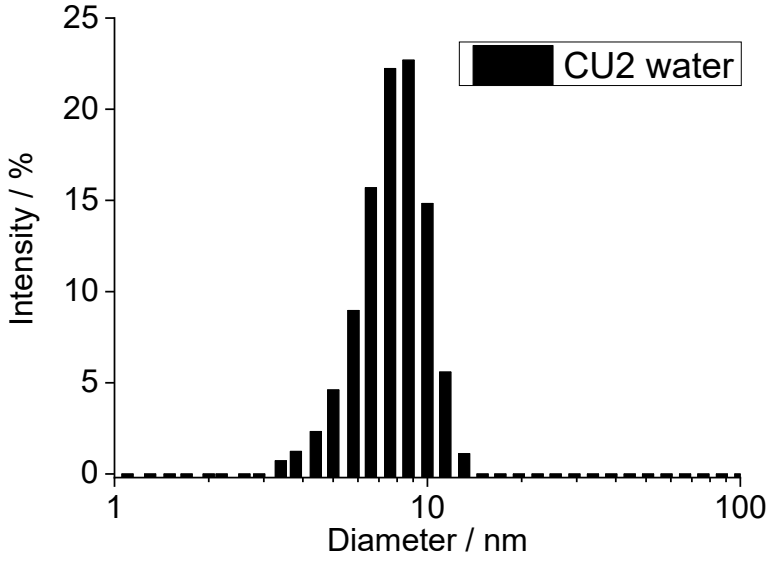
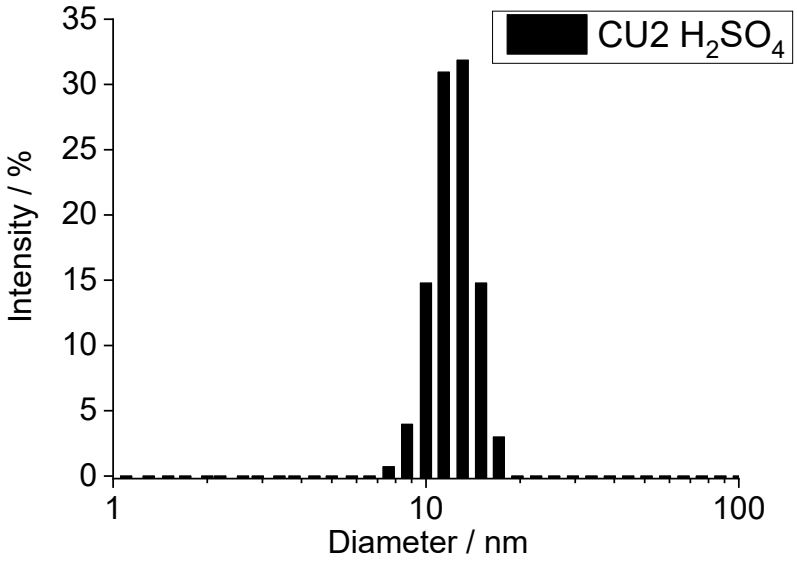


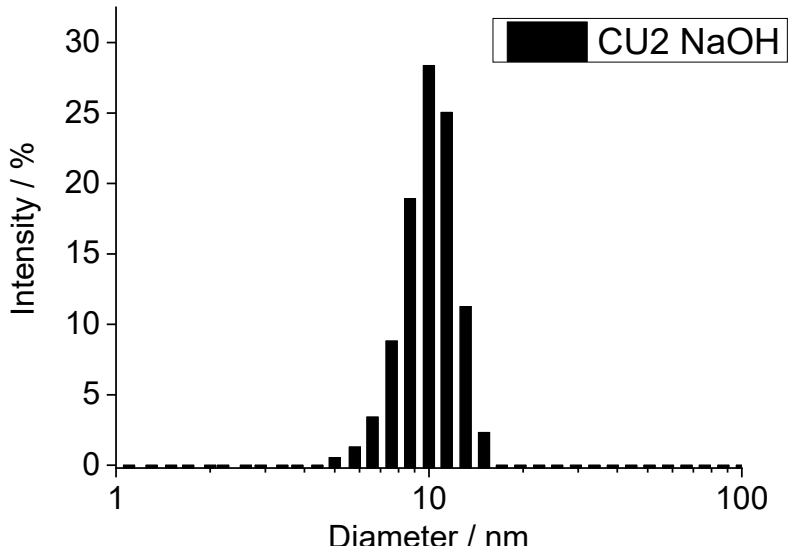
Figure S3. PL emissions of CU2 C-dots in sulfuric acid (10%) with excitation at 350 nm (black) and 420 nm (red) at the C-dots concentrations of (**a**) 1 mg L^{-1} and (**c**) 0.1 mg L^{-1} and after neutralization with NaOH pellets with excitation at 350 nm (black) and 420 nm (red) at the C-dots concentrations of (**b**) 1 mg L^{-1} and (**d**) 0.1 mg L^{-1}.The asterisks indicate Raman vibrational modes of water; Figure S4: Light scattering analysis of CU2 and CU25 C-dots in the aqueous solutions (10 mg L^{-1}) at different pH values (water = 7, H_2SO_4 = 1, NaOH = 14); * The asterisks indicate Raman vibrational modes of water.



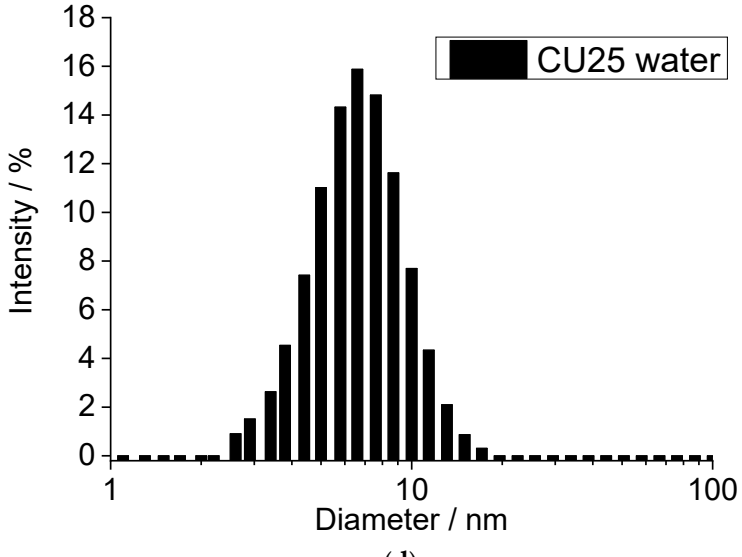
(**a**)


CU2 H_2SO_4
Intensity / %
Diameter / nm
0
5
10
15
20
25
30
35
1
10
100

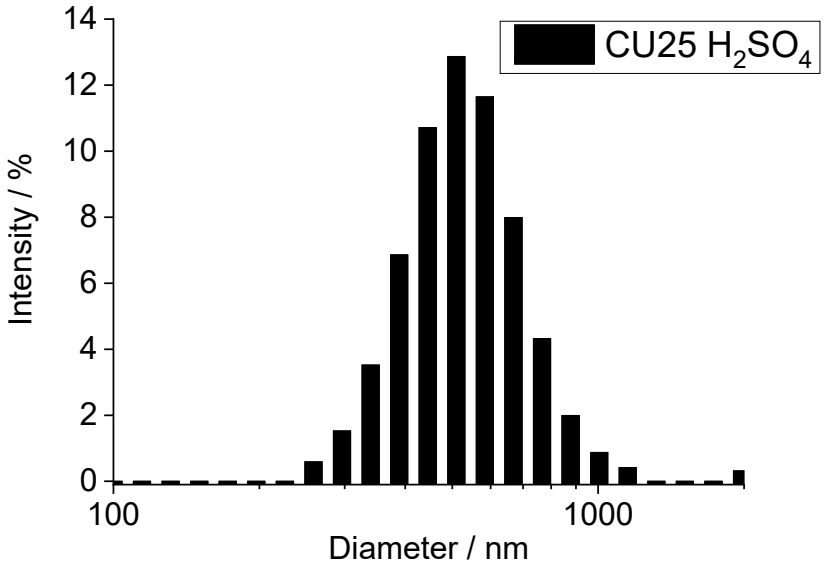
(**b**)


CU2 NaOH
Intensity / %
Diameter / nm
0
5
10
15
20
25
30
1
10
100

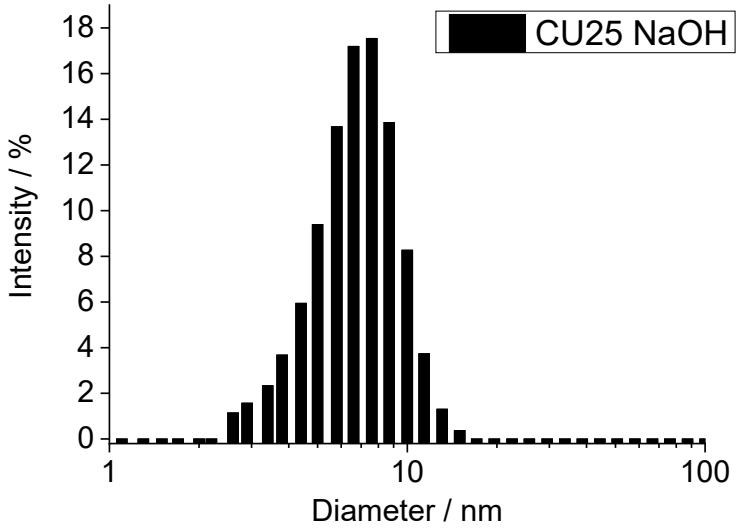
(**c**)


CU25 water
Intensity / %
Diameter / nm
0
2
4
6
8
10
12
14
16
18
1
10
100

(**d**)



(**e**)



(**f**)

Figure S4. Light scattering analysis of CU2 and CU25 C-dots in the aqueous solutions (10 mg L^{-1}) at different pH values (water = 7, H_2SO_4 = 1, NaOH = 14). CU2 in (**a)** water; (**b**) H_2SO_4 and (**c**) NaOH; CU25 in (**d**) water, (**e**) H_2SO_4 and (**f**) NaOH.

Table 1. Decay lifetimes under excitations at 340 and 405 nm.

SAMPLE	τ_1	τ_2
CU2/water (λ_{ex} = 340 nm; λ_{em} = 420 nm)	4.7 ns	10.0 ns
CU2/H_2SO_4 (λ_{ex} = 340 nm; λ_{em} = 420 nm)	2.1 ns	7.7 ns
CU2/H_2SO_4 (λ_{ex} = 405 nm; λ_{em} = 510 nm)	2.5 ns	6.2 ns
CU2/NaOH (λ_{ex} = 340 nm; λ_{em} = 420 nm)	5.3 ns	9.1 ns
CU25/water (λ_{ex} = 405 nm; λ_{em} = 510 nm)	4.4 ns	9.1 ns
CU25/H_2SO_4 (λ_{ex} = 405 nm; λ_{em} = 510 nm)	3.2 ns	6.9 ns
CU25/NaOH (λ_{ex} = 340 nm; λ_{em} = 420 nm)	2.3 ns	7.8 ns
CU25/NaOH (λ_{ex} = 405 nm; λ_{em} = 510 nm)	2.8 ns	9.1 ns