Supporting information for

Selective Detection of Sulfasalazine Antibiotic and Controllable Photodegradation of Its into 5-Aminosalicylic acid by Visible-Light-Responsive Metal–organic Framework

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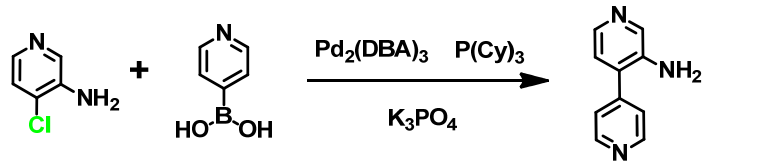
Materials, Synthesis and Instrumentation:

All chemicals were acquired from commercial sources with reagent grade quality and directly used. Sulfonamides antibiotics were obtained from Shanghai Aladdin Biochemical Technology Co., Ltd, including Sulfasalazine and other Sulfonamides antibiotics. Eosin Y were obtained from Sahn Chemical Technology (Shanghai) Co., Ltd. $Co(NO_3)_2 \cdot 6H_2O$ were obtained from Guangdong Chemical Reagent Engineering-technology Research and Development Center.

The sythesis of 3-Amino-4,4′-bipyridine (Bpy-NH_2): A three-necked flask was charged with 1.9 g (15 mmol) of 3-amino-4-chloropyridine, 2.7 g (22 mmol) of pyridine-4-boronic acid, 225 mg (0.28 mmol) of tris(dibenzylideneacetone) dipalladium(0) ($Pd_2(DBA)_3$), and 180 mg (0.64 mmol) of tricyclohexylphosphine ($P(Cy)_3$) and purged with N_2. The mixture was suspended in 40 mL of deoxygenated 1,4-dioxane. A solution of 8 g (38 mmol) of K_3PO_4 in 25 mL of deoxygenated water was added by syringe through a septum. The flask was added to an oil bath at 60 °C and slowly heated to reflux (100 °C). The mixture was held at reflux with rapid stirring overnight (~18 h). Upon being cooled to room temperature, the mixture was poured into a separatory funnel and the lower aqueous phase removed and discarded. The dioxane layer was collected and filtered and the dioxane removed under reduced pressure. The residue was triturated in 75 mL of ethyl acetate, treated with activated carbon and anhydrous magnesium sulfate, and then heated to reflux for 10 min with

stirring. The mixture was filtered hot through a fine glass frit. The filtrate was concentrated and cooled to yield 2.1 g (12.3 mmol) of the tan crystalline product.



3-Amino-4,4'-bipyridine

X-Ray powder diffraction (XRD) measurement was performed in an X−ray powder diffractometer (Japan) with a model of Rigaku D/max-2400 under Cu−Kα radiation of 1.5405 Å wavelength. A Mettler-Toledo TGA/SDTA851 instrument was used for thermogravimetric analysis (TGA) in a nitrogen flow at a 5 °C/min ramp rate. X-ray photoelectron spectroscopy (XPS) experiments were performed with a PHI QUANTUM2000 surface analysis instrument. The morphologies of the prepared samples were recorded by a Field Emission Scanning Electron Microscopy (SEM) of Hitachi SU8010. Samples were treated *via* Pt sputtering for 90 s before observation. And energy dispersive X-ray spectroscopy (EDS) images were captured with an equipment of EDAX PW9900. Fluorescent spectra of the solution were measured on Hitachi F-4600. Fluorescence measurements of Co−EYNB suspension were performed in a 1 cm quartz cuvette.

Crystallography: Intensities were collected on a Bruker SMART APEX CCD diffractometer with graphite monochromated Mo-Kα (λ = 0.71073 Å) using the SMART and SAINT programs. The exposure time is 20 s and frame width is 0.5^{o} during the data collection. The structure was solved by direct methods and refined on

F^2 by full-matrix least-squares methods with SHELXTL version 5.1. Non-hydrogen atoms of the ligand backbones were refined anisotropically. Hydrogen atoms within the ligand backbones were fixed geometrically at calculated positions and allowed to ride on the parent non-hydrogen atoms. The SQUEEZE program was used to remove the contributions of disordered solvent.

Data Plots: Diffraction Data

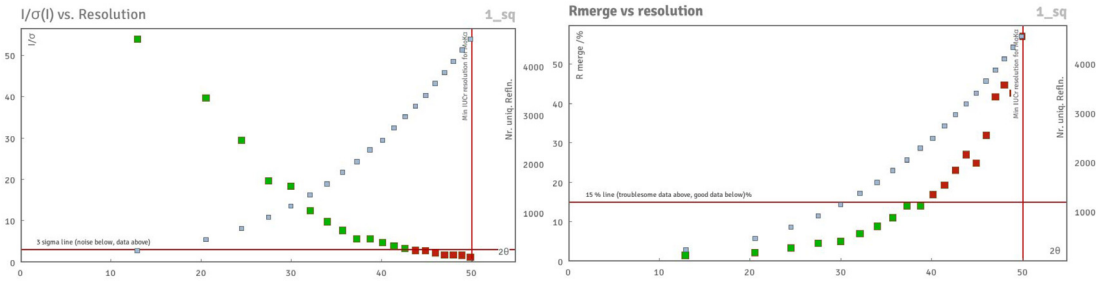


Table S1. Selective bond distance (Å) and angle (°) in Co-EYNB.

Co(1)−O(1)	1.942(7)	Co(1)−O(2[1])	1.941(6)
Co(1)−O(3[2])	1.913(7)	Co(1)−N(1B)	2.125(10)
Co(1)−N(1[3])	2.047(10)		
O(2[1])−Co(1)−O(1)	121.0(3)	O(3[2])−Co(1)−O(1)	114.6(3)
O(3[2])−Co(1)−O(2[1])	118.7(3)	N(1B)−Co(1)−O(1)	95.1(4)
N(1B)−Co(1)−O(2[1])	106.5(5)	N(1B)−Co(1)−O(3[2])	91.5(4)
N(1[3])−Co(1)−O(1)	102.4(5)	N(1[3])−Co(1)−N(1B)	12.2(8)
N(1[3])−Co(1)−O(2[1])	94.4(6)	N(1[3])−Co(1)−O(3[2])	97.1(4)

Symmetry code [1]1-x,+y,1/2-z; [2]+x,-y,-1/2+z; [3]1-x,1-y,-z.

Figure S1. TGA traces of Co-EYNB ranging from room temperature to 800 °C.

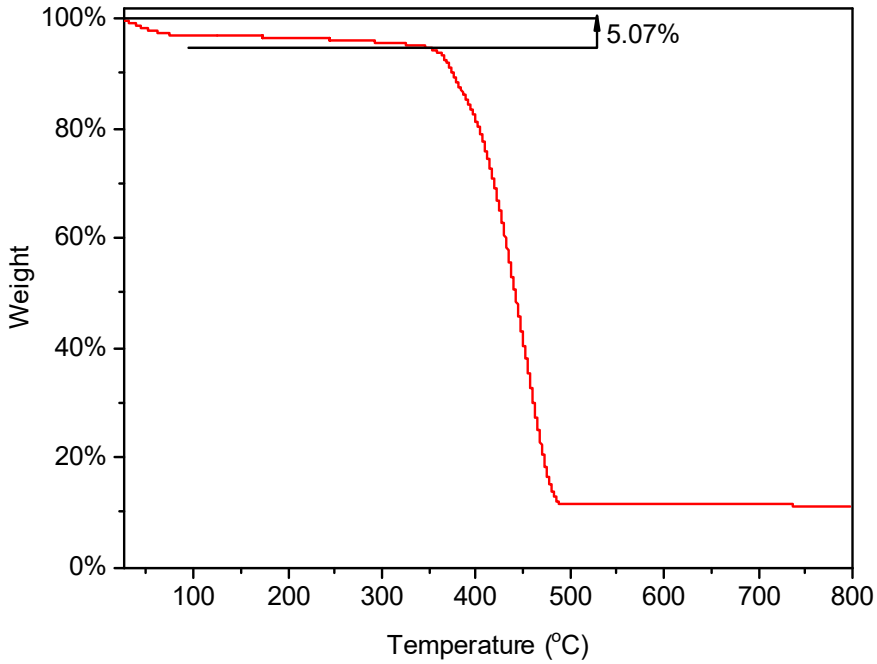


Figure S2. N_2 physisorption isotherms of Co-EYNB.

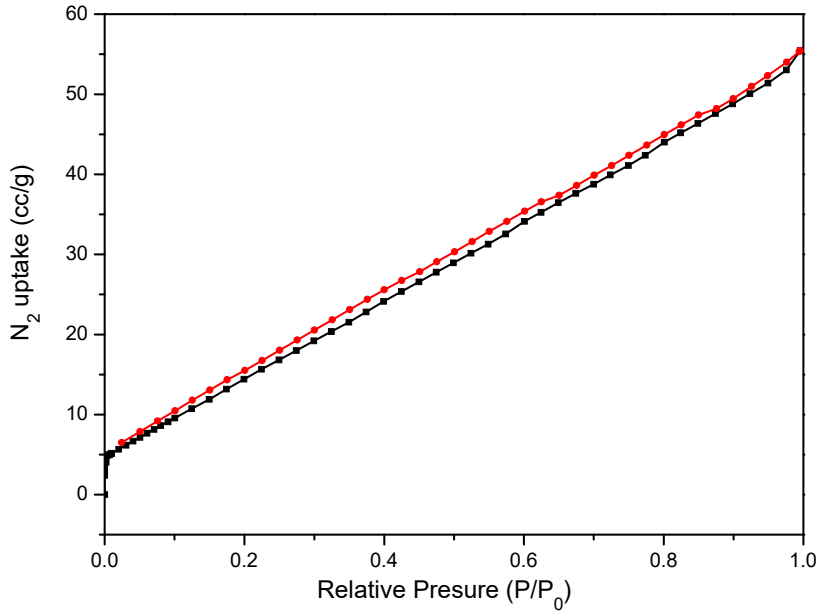


Figure S3. Pore size distribution of Co-EYNB.

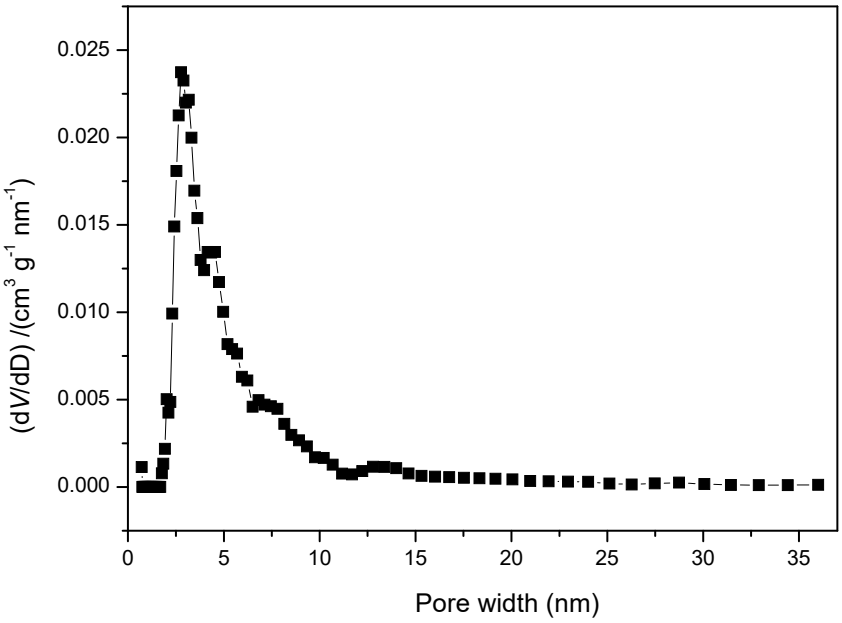
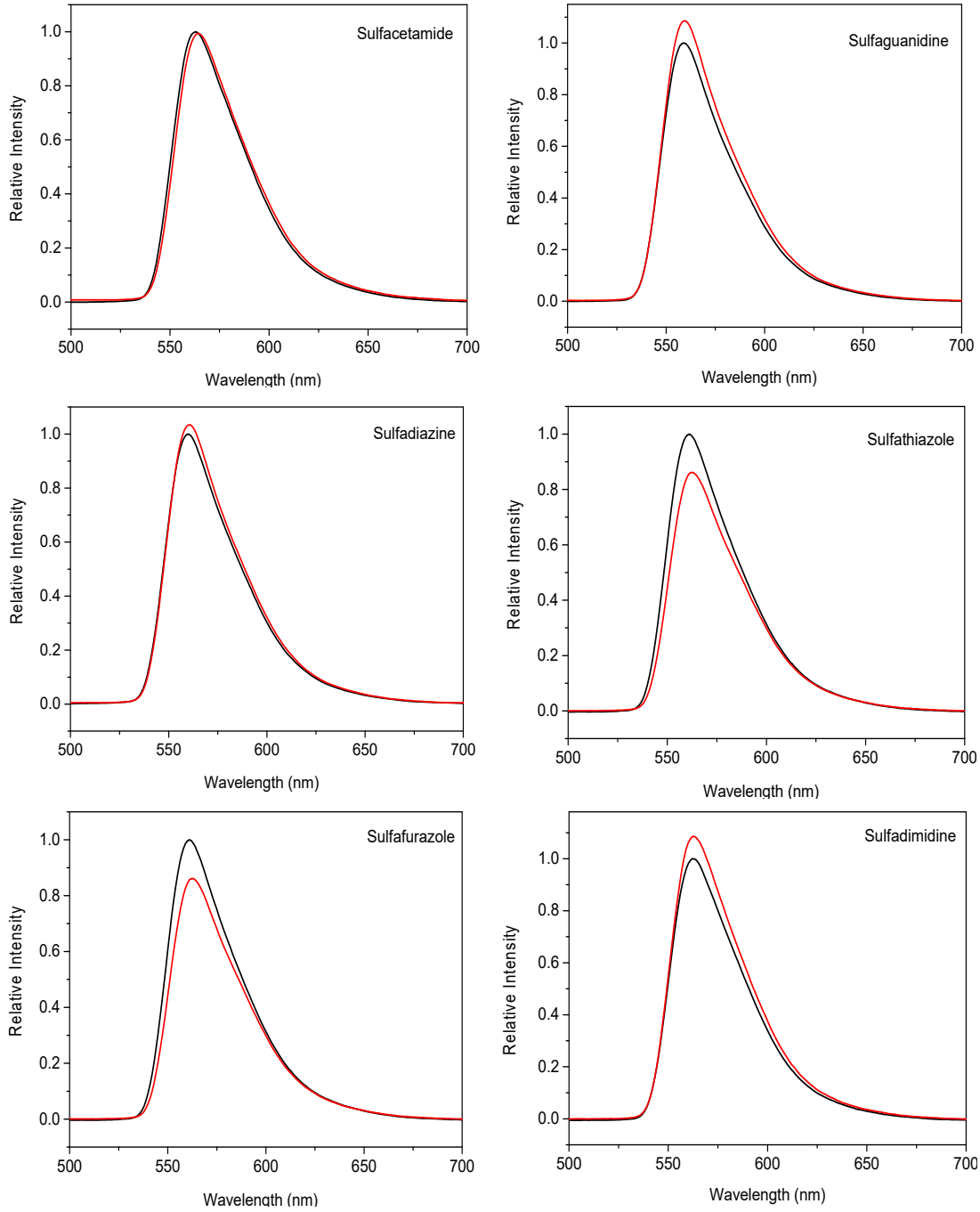


Figure S4. Families of various fluorescence spectra of Co-EYNB in water solution upon the addition of 1.62 mM of different selected sulfonamides antibiotics.



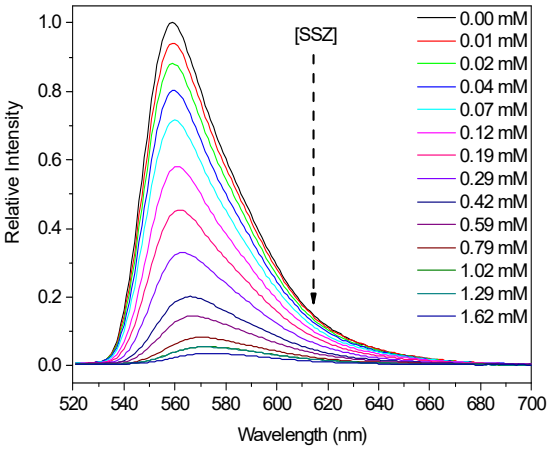

Relative Intensity
Wavelength (nm)
[SSZ]
0.00 mM
0.01 mM
0.02 mM
0.04 mM
0.07 mM
0.12 mM
0.19 mM
0.29 mM
0.42 mM
0.59 mM
0.79 mM
1.02 mM
1.29 mM
1.62 mM
0.0
0.2
0.4
0.6
0.8
1.0
520
540
560
580
600
620
640
660
680
700

Figure S5. (Top) The fluorescence intensity of Co-EYNB with varying SSZ concentrations. (Bottom) The Stern−Volmer plot of Co-EYNB quenched by SSZ solution, where I_0 and I are the fluorescence intensity before and after SSZ incorporation, respectively.

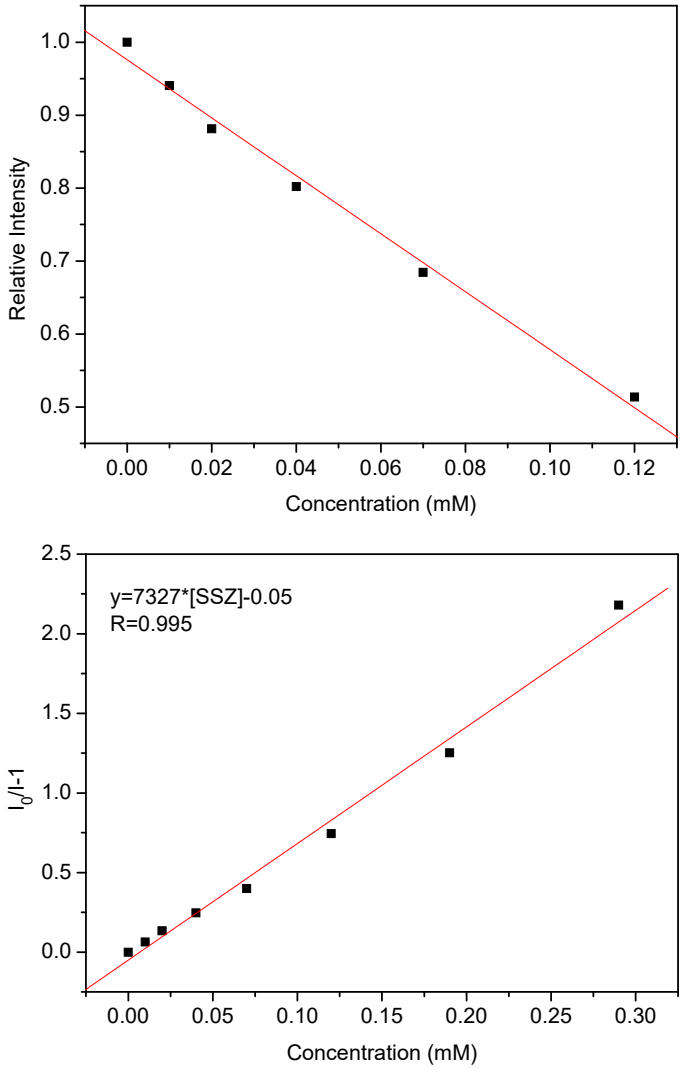


Figure S6. (Top) Fluorescence spectra of Co-EYNB with gradual addition of different concentrations of SSZ in HEPES buffer solutions. (Bottom) The Stern−Volmer plot of Co-EYNB quenched by SSZ in HEPES buffer solutions, where I_0 and I are the fluorescence intensity before and after SSZ incorporation, respectively.

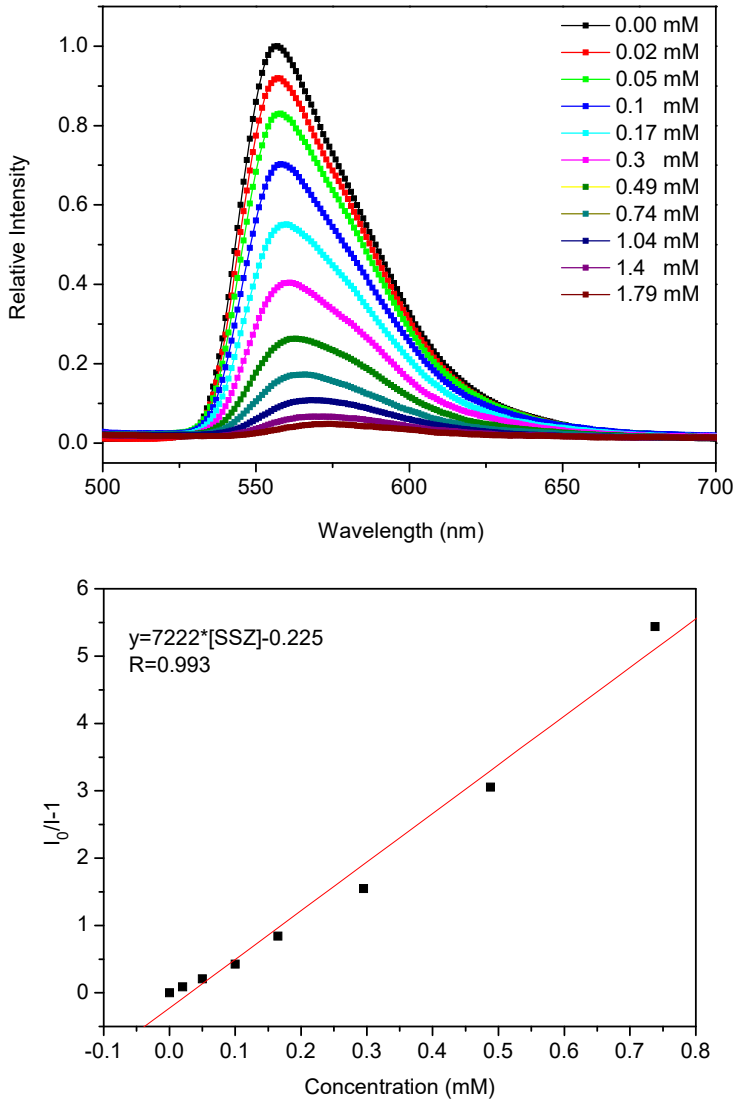


Figure S7. PXRD profiles for simulated (black line), as-synthesized Co-EYNB (red line) and Co-EYNB after immersion in water for one month (green).

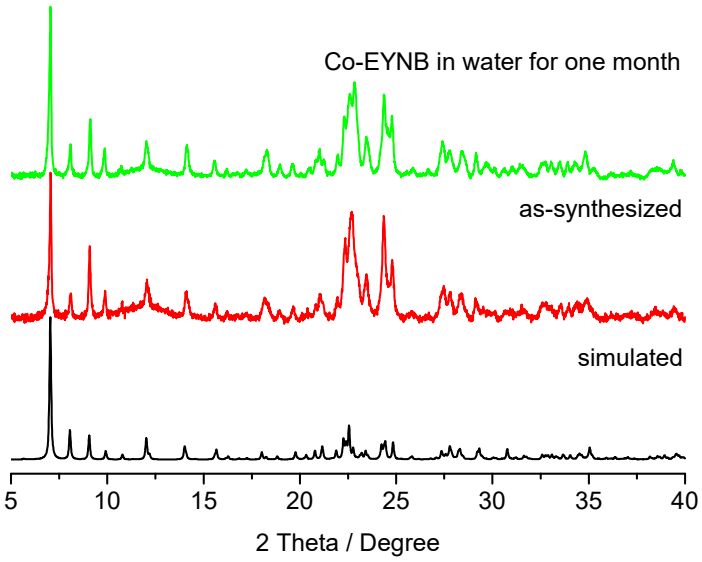


Figure S8. Absorption spectra of the SSZ solutions during the decomposition reaction catalyzed by complex Co-EYNB.

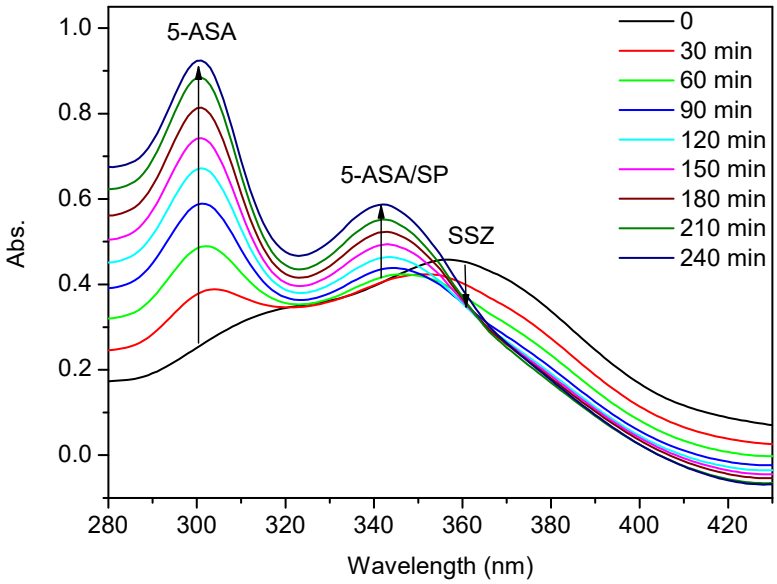


Figure S9. MS of the solution after photodegradation in 120 min.

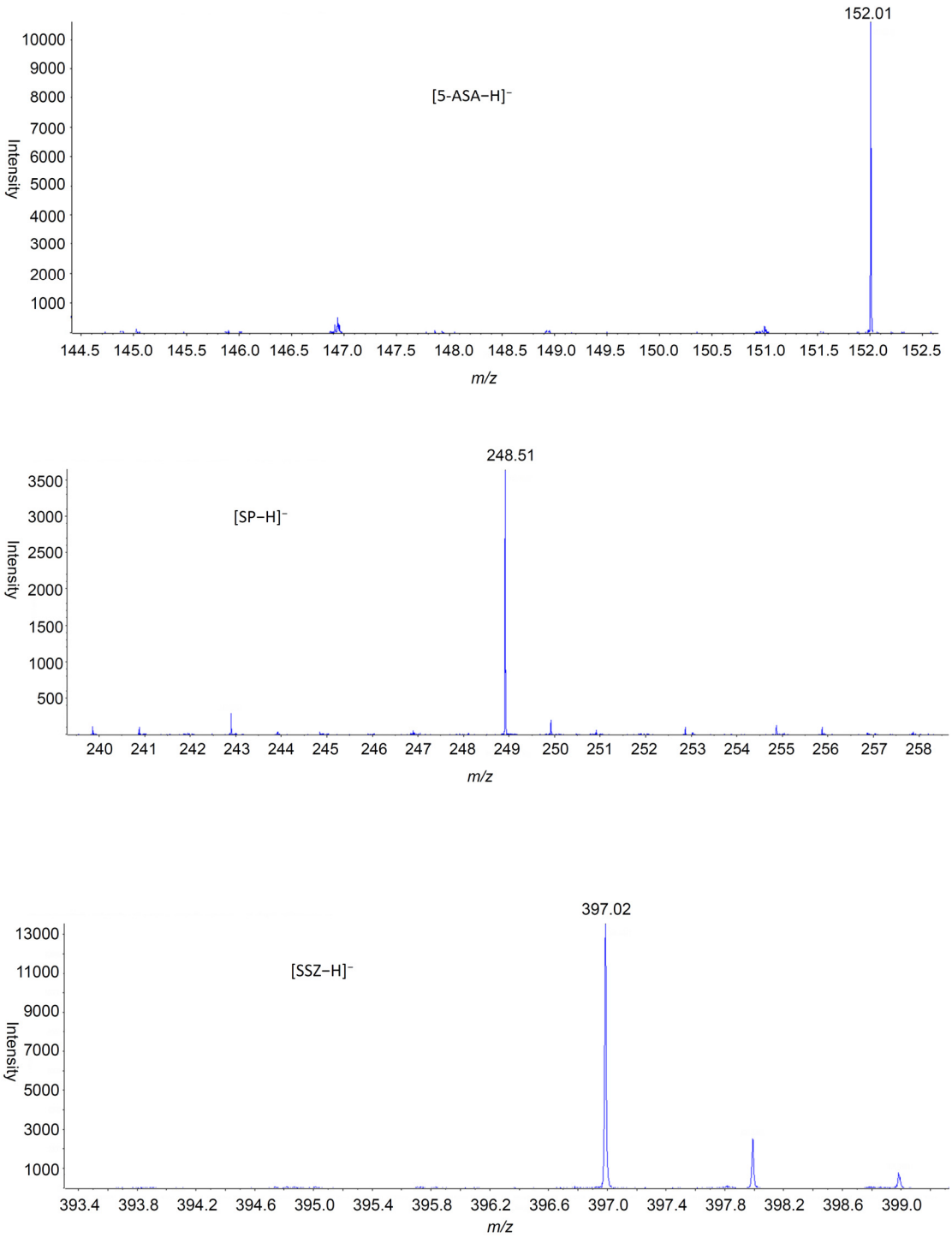


Figure S10. ^{1}H NMR spectra of 5-ASA and the substances obtained after photodegradation experiment in DMSO-d_6.

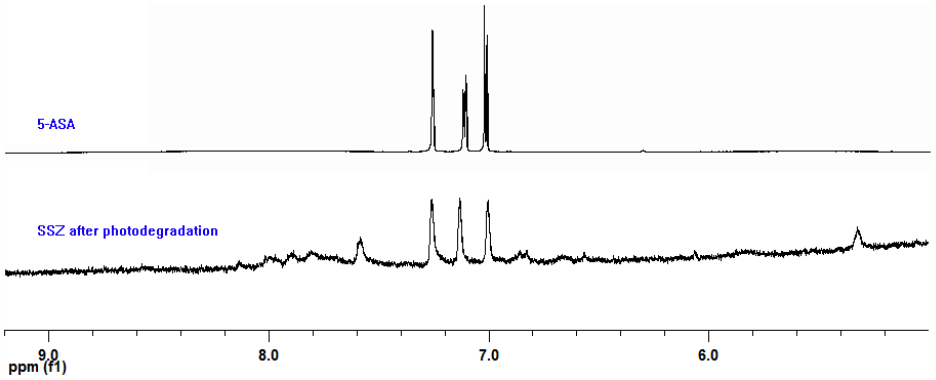


Figure S11. Absorption spectra of the SSZ solutions during the decomposition reaction catalyzed by P25.

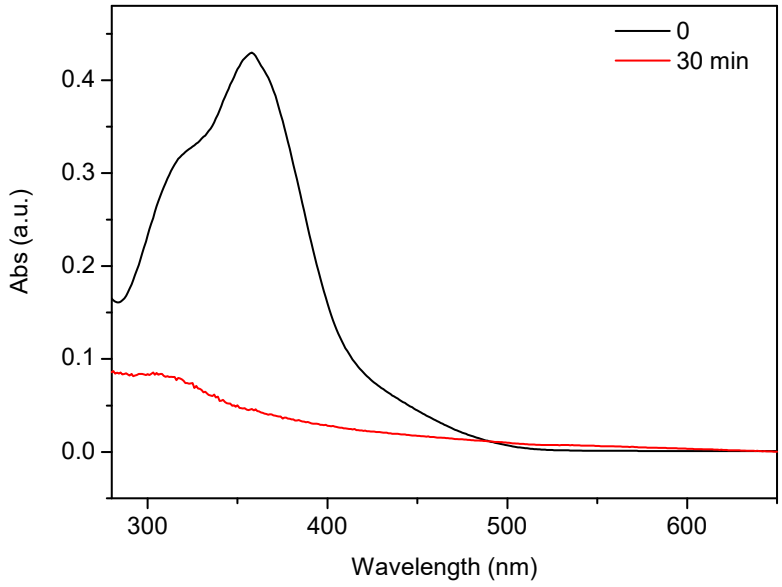


Figure S12. Luminescent spectral changes with visible-light irradiation time over Co-EYNB in a 5×10^{-5} M basic solution of terephthalic acid.