Acid- responsive metal organic frameworks with photothermal effects for osteoarthritis synergistic therapy

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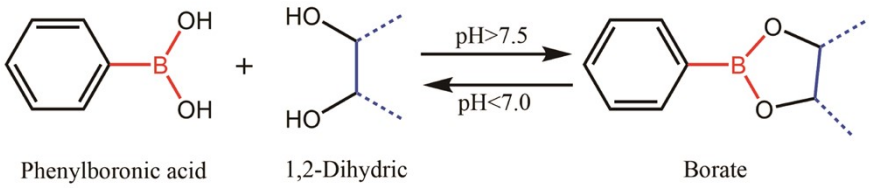
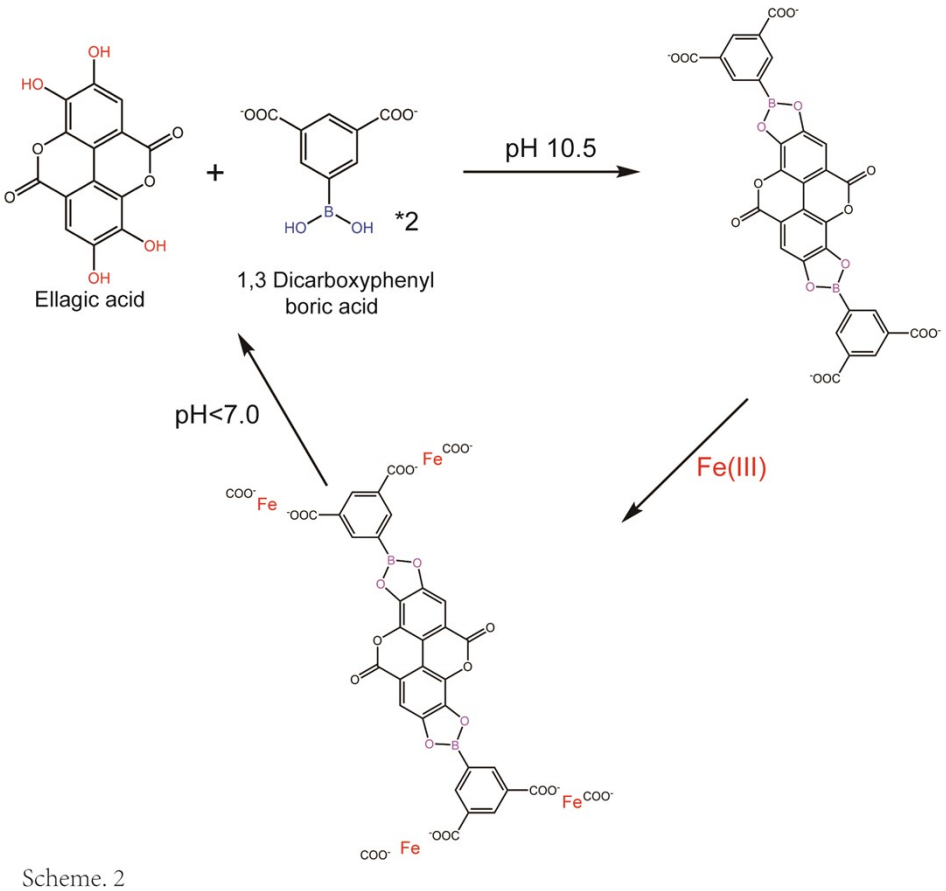


Scheme. 1



Scheme. 2

Fig. S1. Scheme. 1 The reaction of PBA and diol, combined under alkaline conditions and dissociated under acidic conditions. Scheme. 2 The specific synthesis process of EA.

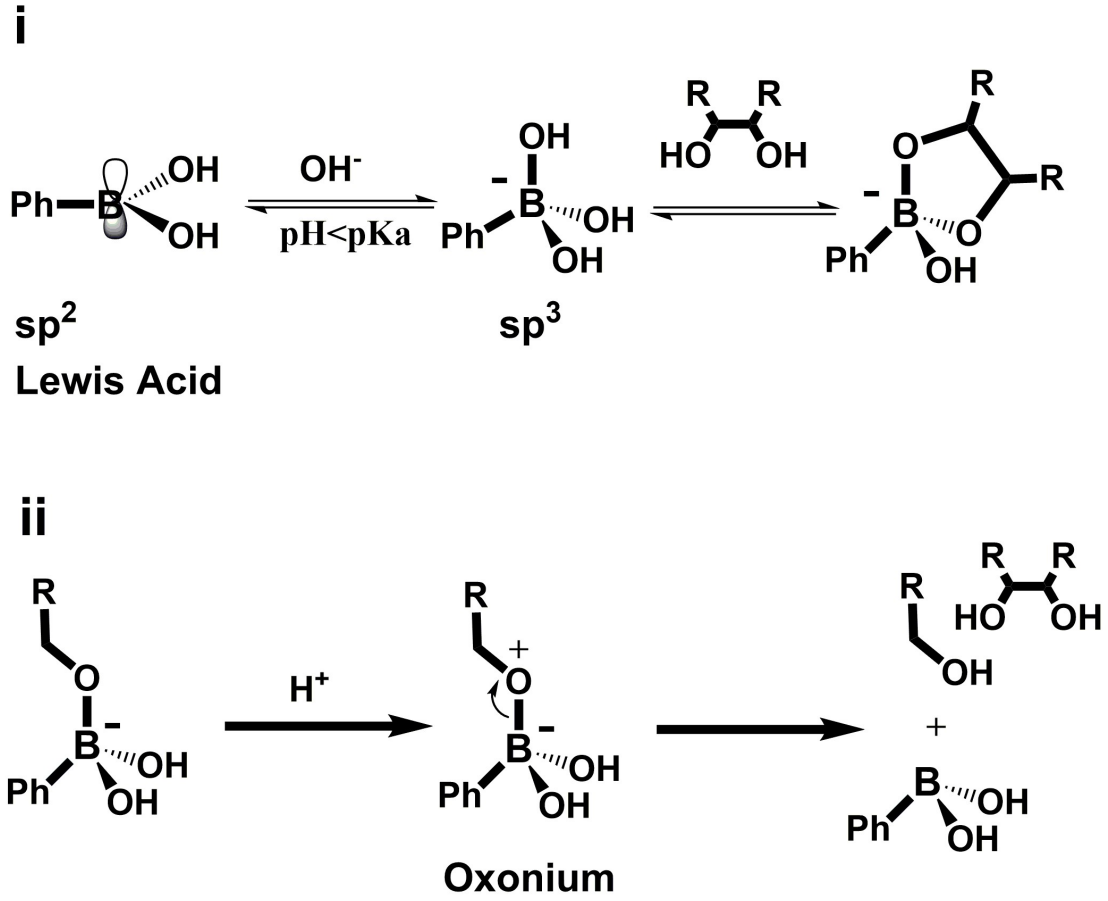


Fig. S2. Scheme: i: The combination of PBA and Diol; ii: Hydrolysis of borate esters.

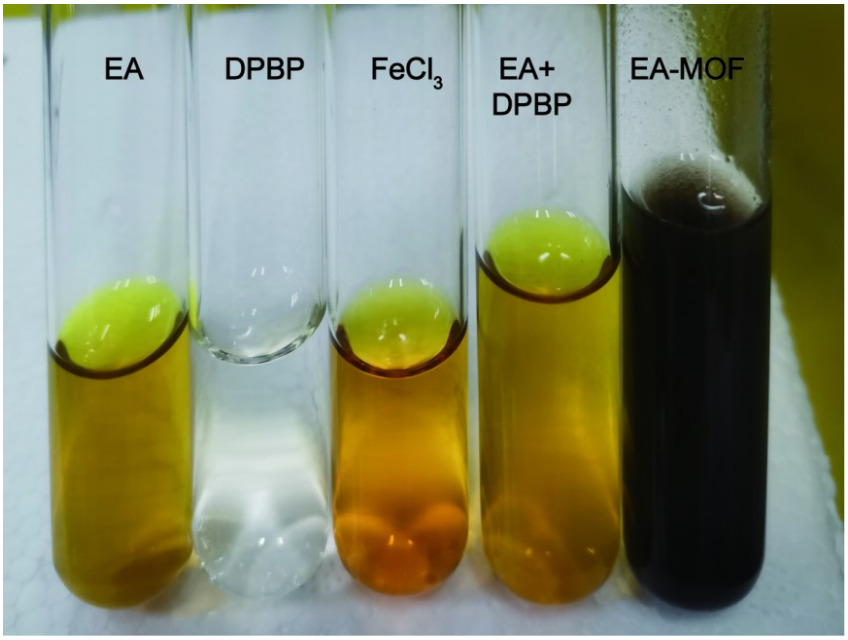


Fig. S3. Picture of synthesis of EA-MOF.

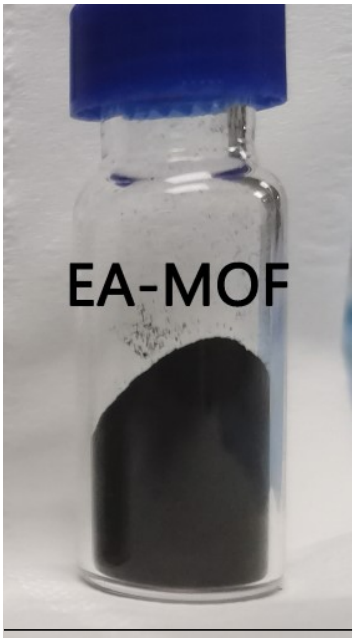


Fig. S4. The picture of EA-MOF powder.

Theoretical calculation			
Molecular formula	Molecular weight	B% (m/m)	EA% (m/m)
$(C_{30}H_8B_2O_{16}Fe_2)_n$	$(757.6)_n$	3.1%	39.3%
Tested			
B%(SEM)	B% (Elemental analysis)		EA% (m/m)
4.9% (m/m)	5.17% (m/m)		41.7% (Acid dissolution)

Table.1. Content of EA and B element.

Name	Specific surface area (m^2/g)
EA	0.750348
Fe-OH	18.91207
EA-MOF	143.208671

Table.2. BET of EA, Fe-OH and EA-MOF.

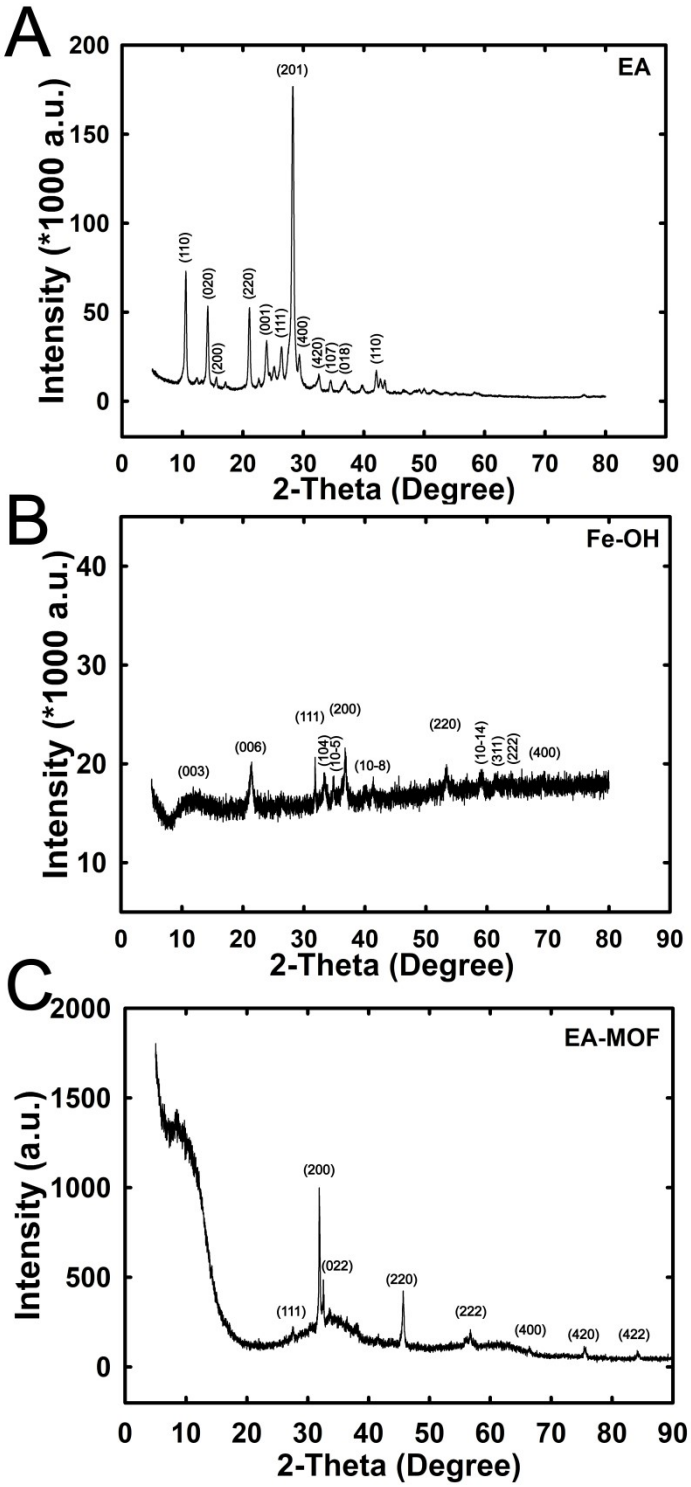


Fig. S5. The XRD for: A: EA; B: Fe-OH; C: EA-MOF.

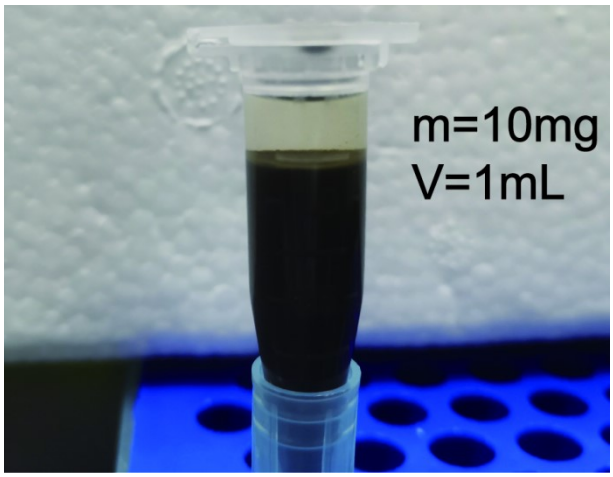


Fig. S6. The density of MOF in the water.

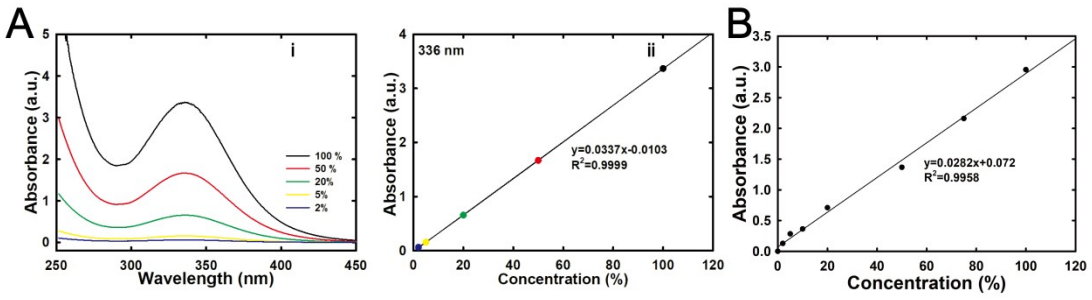


Fig. S7. Light absorption characteristics of EA-MOF dissolve solution. (A) i. Light absorption characteristics of dissolve solutions with different concentrations. ii. Standard curve of maximum light absorption peak (336nm) (Ultraviolet-visible spectrophotometer). (B) Standard curve at 336 nm (microplate reader).

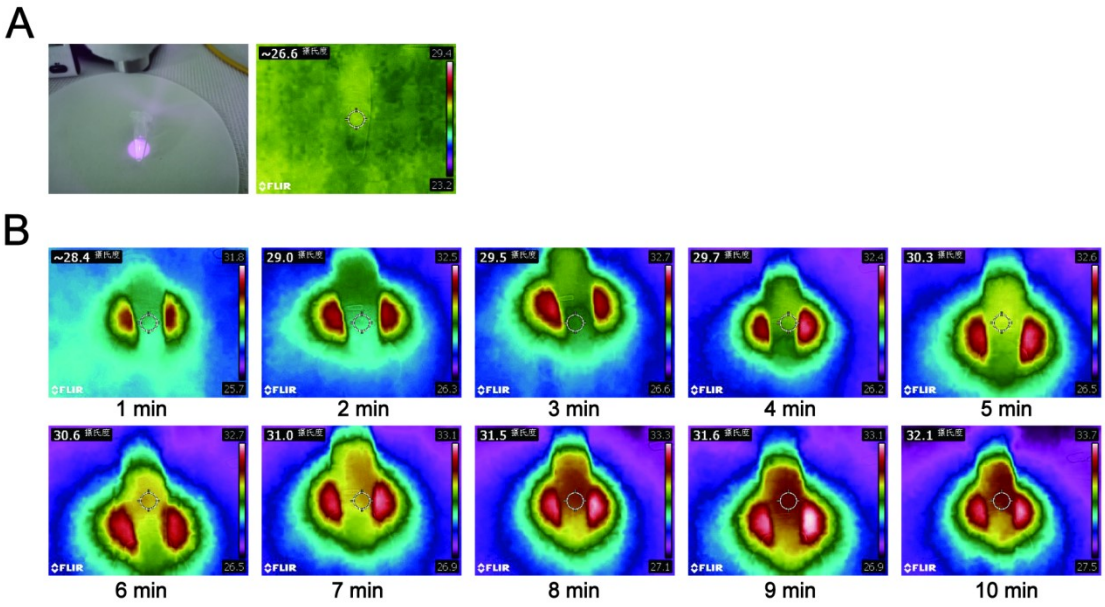


Fig. S8. Picture of photothermal conversion. (A) Visible light photograph and initial infrared photograph. (B) Infrared photos at different times of EA-MOF (100 μg/mL).

Gene name	Forward primer	Reverse primer
GAPDH	5'-TCCAGTATGACTCTACCCAGC-3'	5'-CACGACATACTCAGCACCAG-3'
GSH-Px	5'-TCTGAGGGGATTTTTCTGGA-3'	5'-TGGTATCTGGGCTTGGTGAT-3'
Acan	5'-GAATGGGAGCCAGCCTACAC-3'	5'-GAGAGGCAGAGGGACTTTCG-3'
SOD1	5'-ATTCACTTCGAGCAGAAGGCA-3'	5'-ATTGCCCAGGTCTCCAACAT-3'
MMP-13	5'-GGACAAAGACTATCCCCGCC-3'	5'-GGCATGACTCTCACAATGCG-3'
IL-6	5'-TCTGGTCTTCTGGAGTTCCG-3'	5'-AGCATTGGAAGTTGGGGTAGG-3'
MMP-3	5'-GGCTGTGTGCTCATCCTACC-3'	5'-TGGAAAGGTACTGAAGCCACC-3'

Table 3. Detailed gene primer sequences for qRT- PCR.

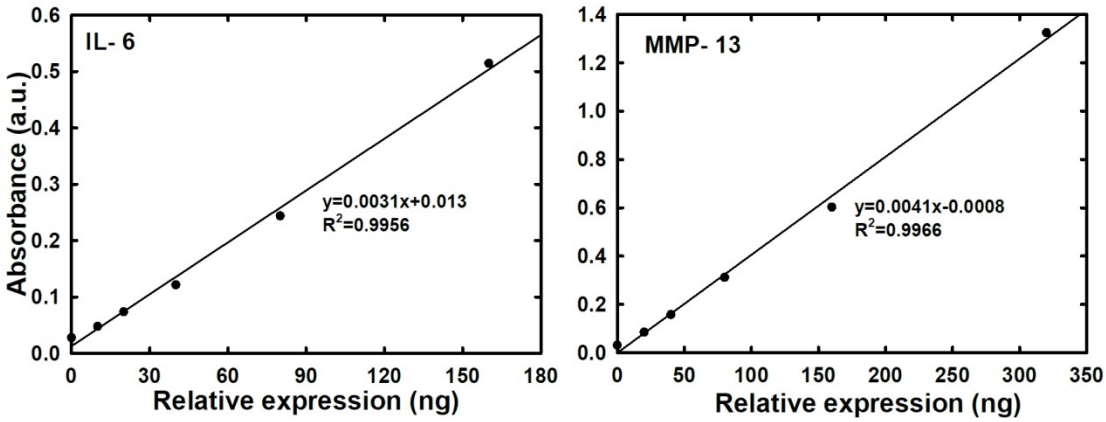


Fig. S9. Standard curve of inflammatory factors (IL-6 and MMP-13) by UV- vis spectroscopy.

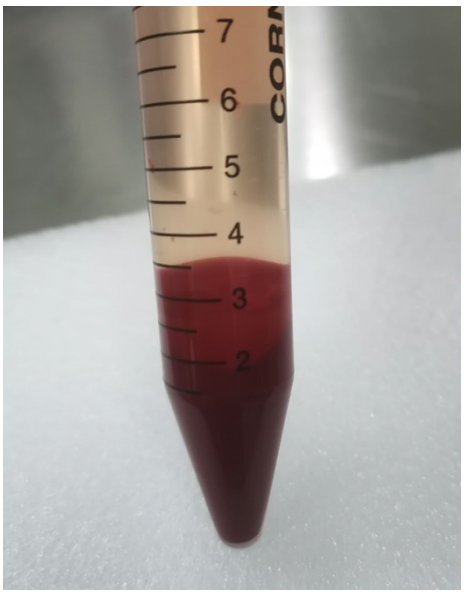


Fig. S10. Suspended erythrocyte (after centrifugation, 800rpm/20min). Erythrocyte collected from SD rat caudal vein, Use sodium citrate for anticoagulation and wash with saline.

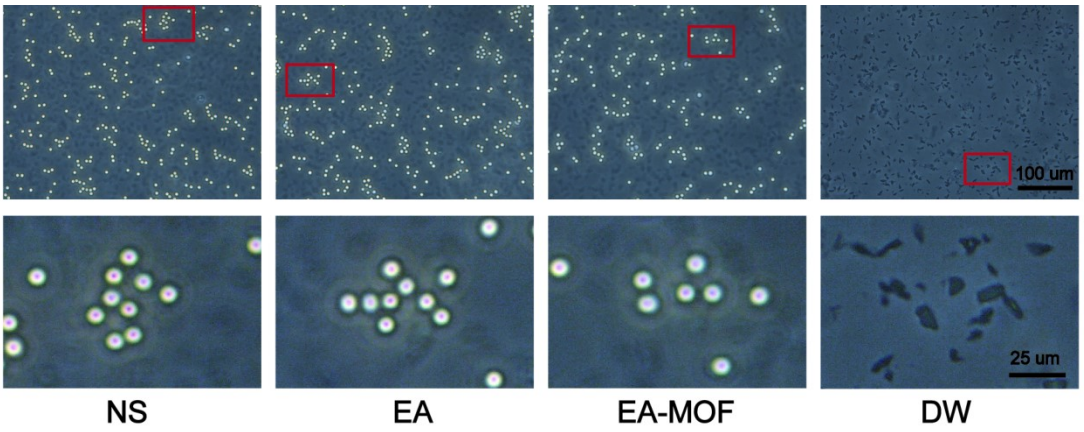


Fig. S11. The hemolysis experiment was observed under the microscope (up) and partially enlarged detail (down).

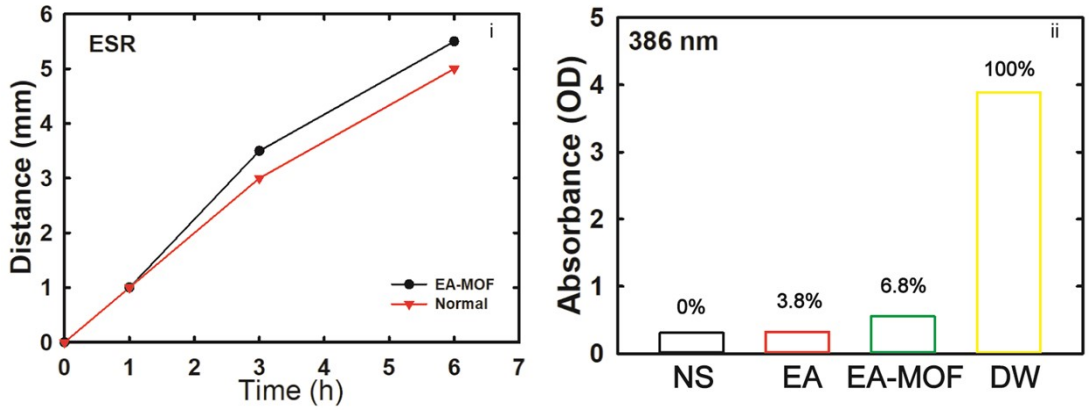


Fig. S12. (Left) Quantification of sedimentation test. (Right) Quantification of hemolysis test use microplate reader.