Electronic Supplementary Material (ESI) for CrystEngComm
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Supplementary Information

Porous urchin-like 3D Co(II)Co(III) LDHs for high performance heterogeneous Fenton degradation

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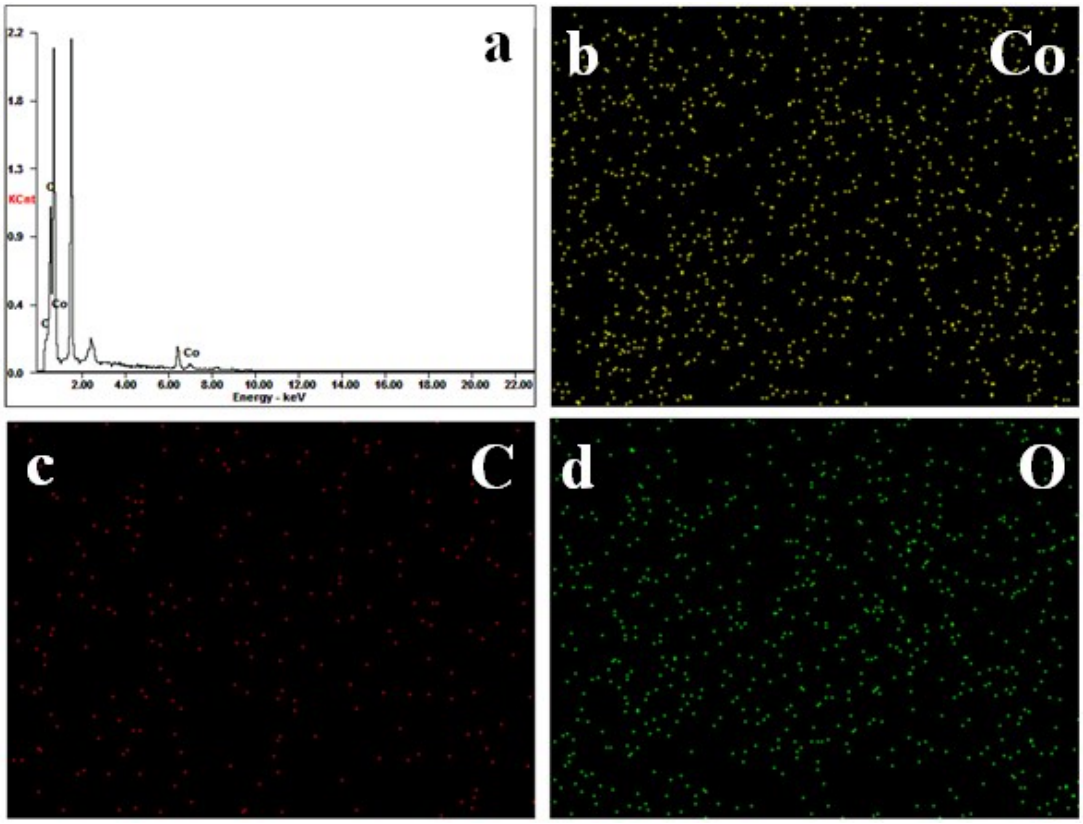


Fig. S1. Energy spectra microanalysis micrographs and EDS distribution maps for cobalt, carbon and oxygen in Co(II)Co(III) LDH (CCLH (120).

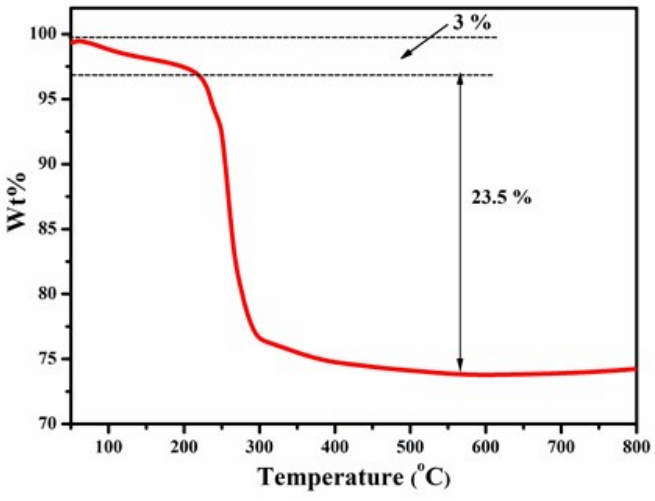


Fig. S2.TGA curve of Co(II)Co(III) LDH in air

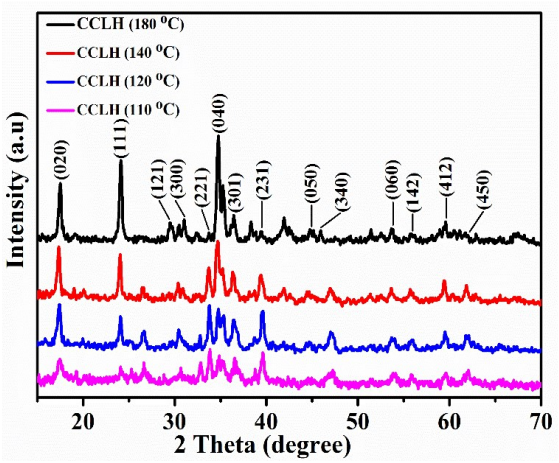


Fig. S3. XRD patterns of the prepared Co(II)Co(III) LDHs.

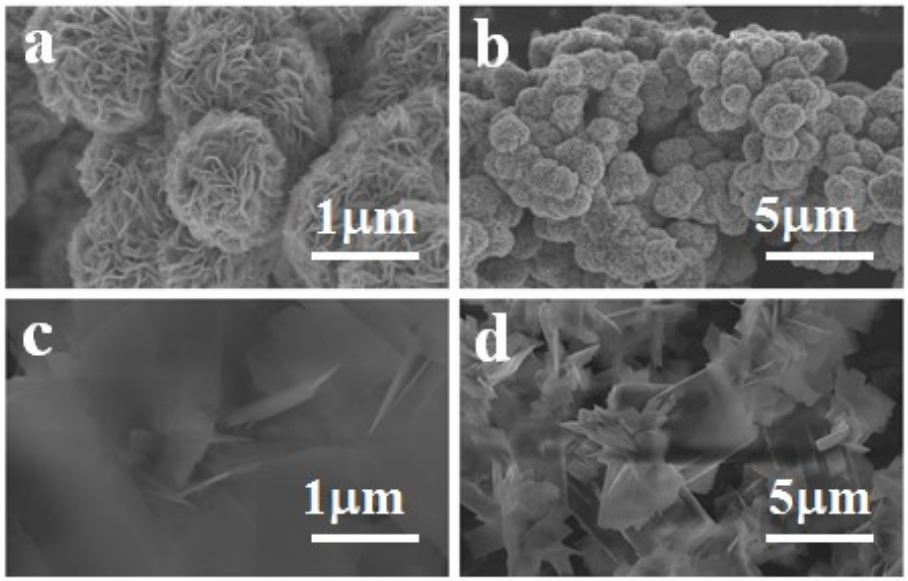


Fig. S4. SEM images of Co(II)Co(III) LDHs synthesized by using (a, b) water and (c, d) n-butanol as a solvent.

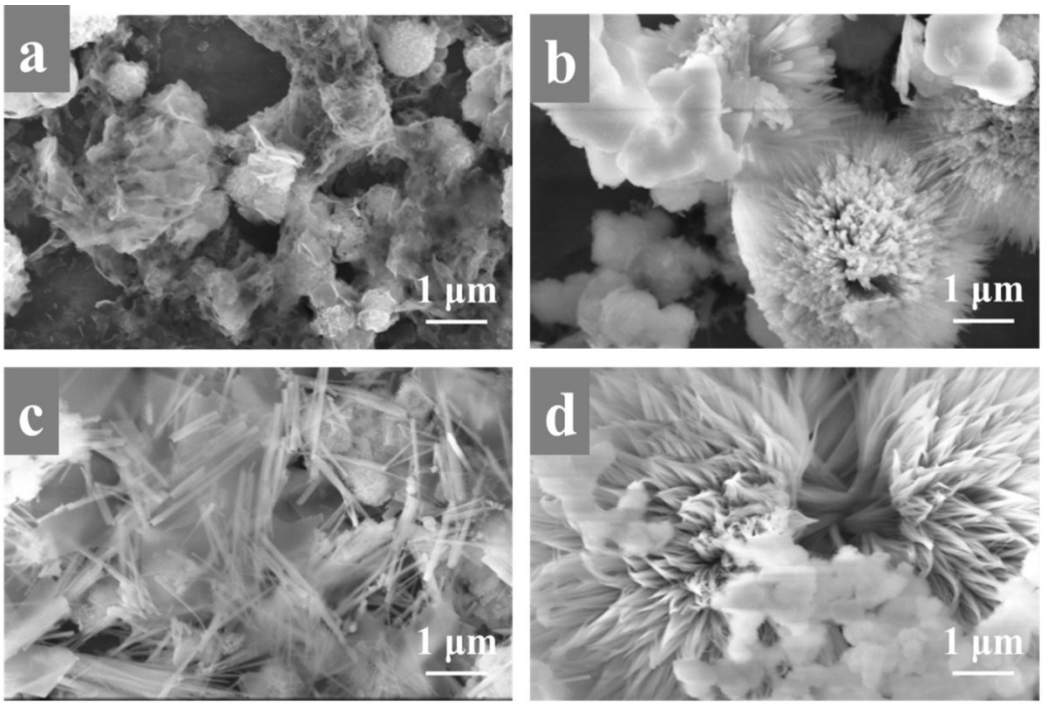


Fig. S5. SEM images of Co(II)Co(III) LDHs synthesized at different reaction time (a) 0.5 h, (b) 1h, (c) 3h, (d) 6h.

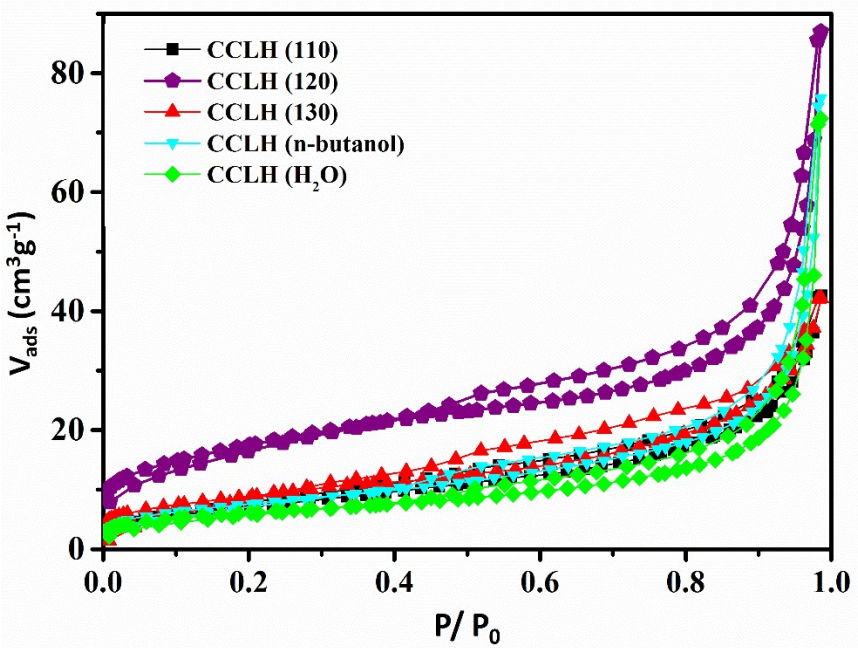


Fig. S6. BET N_2 adsorption–desorption isotherms of the prepared Co(II)Co(III) LDHs.

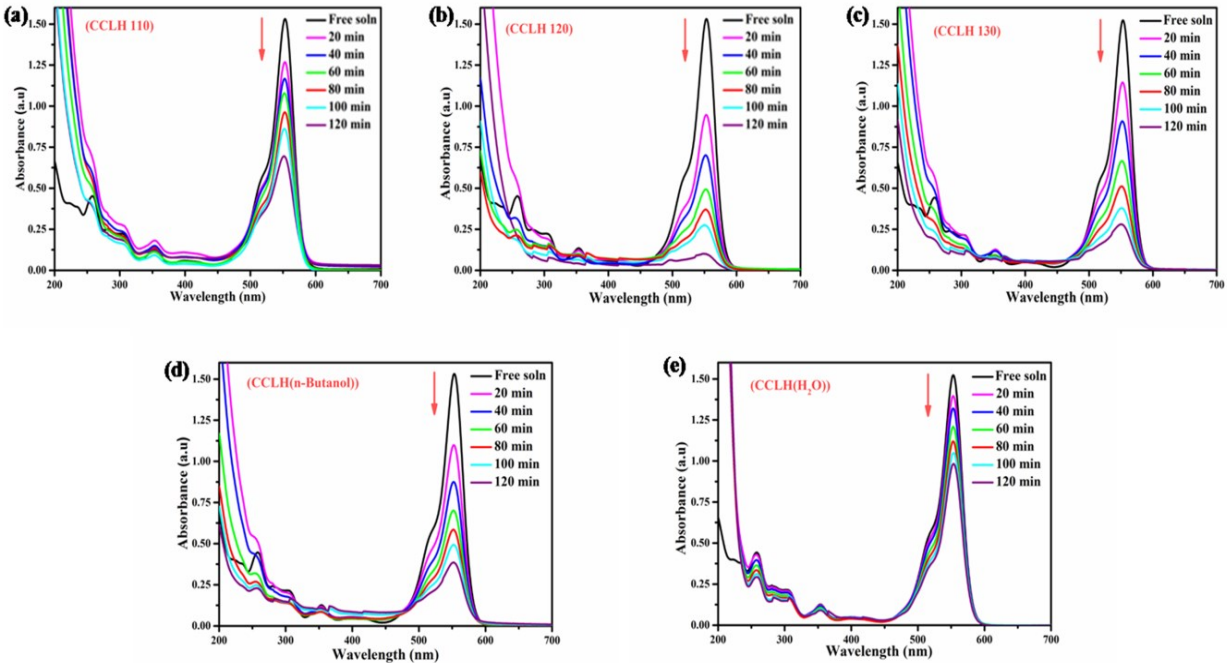


Fig. S7. UV–visible absorption spectra of fenton degradation of RhB at different durations with the addition of 40 µL H_2O_2 and 4mg Co(II)Co(III) LDH at its original pH (a) CCLH(110°C) (b) CCLH(120°C) (c) CCLH(130°C) (d) CCLH(only n-Butanol) (e) CCLH(only H_2O).

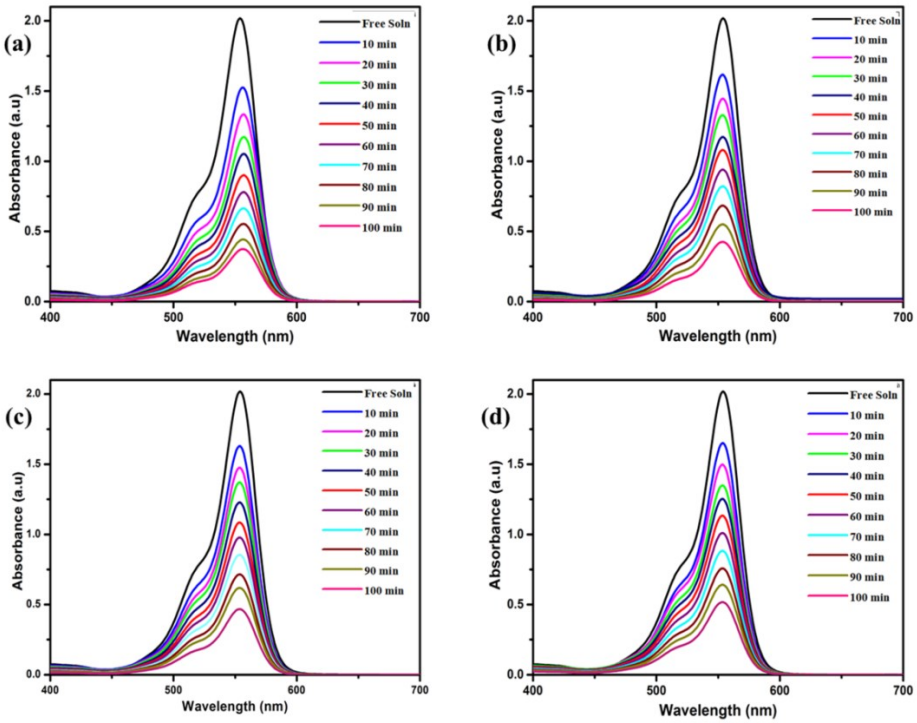


Fig. S8. UV–visible absorption spectra of pH effect on degradation efficiency of catalyst (a) pH 3 (b) pH 4 (c) pH 5 (d) pH 6.

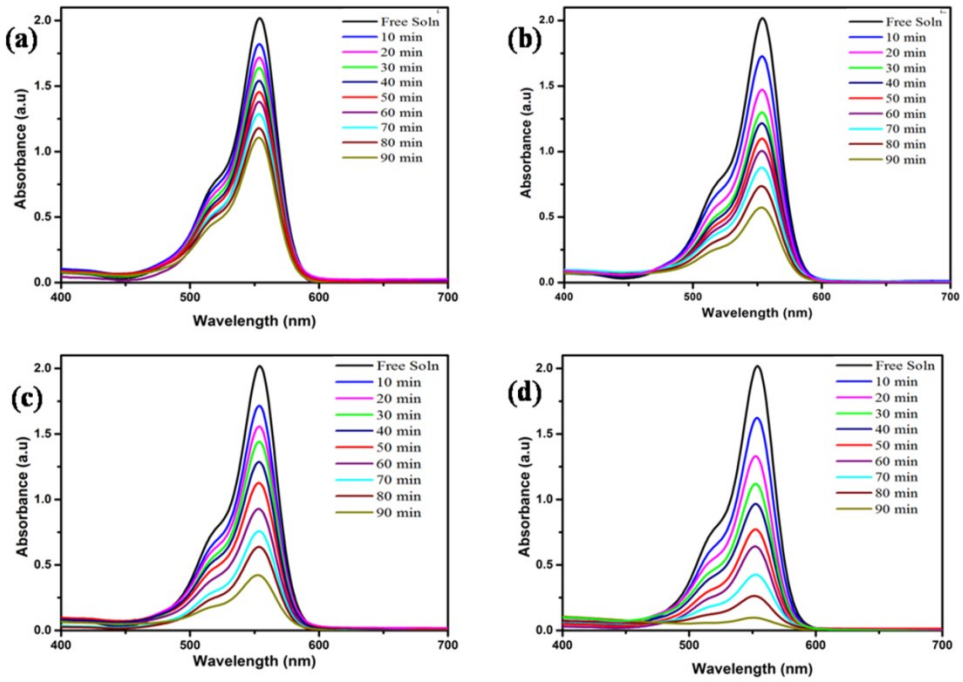


Fig. S9. UV–visible absorption spectra of effect of H_2O_2 dosage on degradation efficiency of catalyst (a) 20 µL(b) 40 µL(c) 50 µL (d) 60 µL.

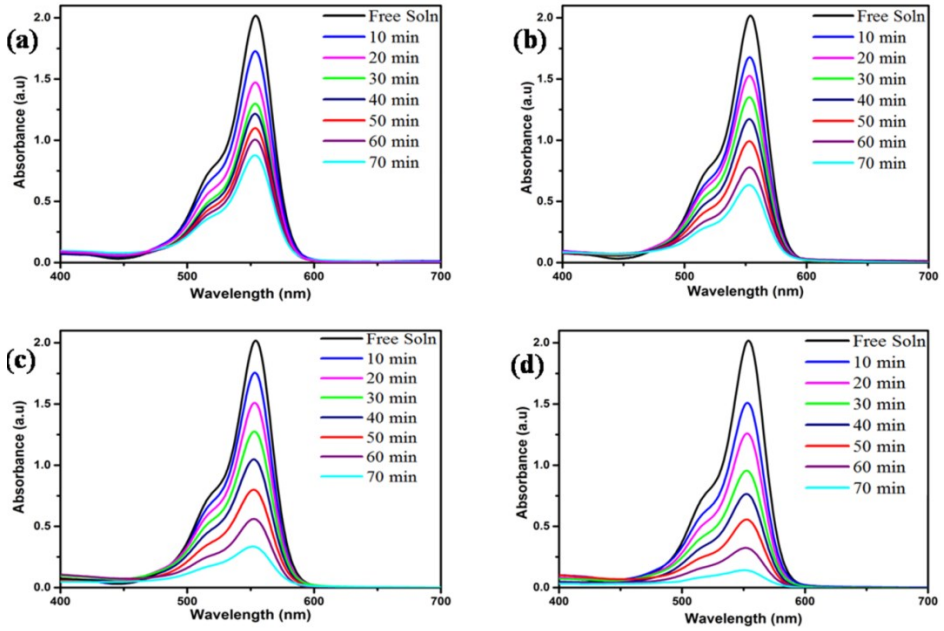


Fig. S10. UV–visible absorption spectra of effect of an amount of catalyst on degradation of RhB (a) 4mg (b) 5mg, (c) 6mg (d) 7mg.

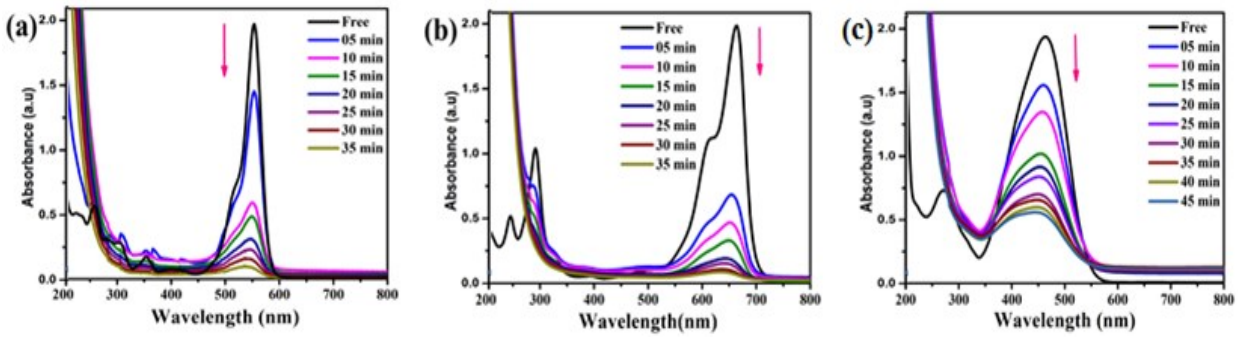
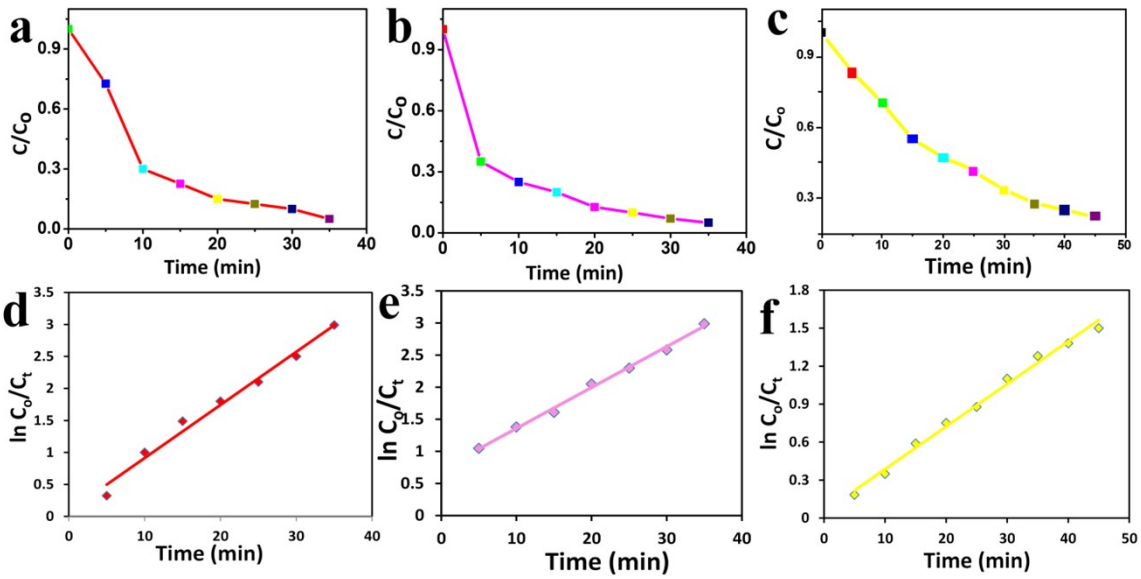


Fig. S11. UV–visible absorption spectra of fenton degradation of different dyes (a) RhB, (b) MB, (c) MO at different durations with the addition of 60 µL H_2O_2 and 5mg (CCLH 120).



S12. Fenton degradation of various dyes (a,b RhB), (c,d MB), (e,f MO) at different durations with the addition of 60 µL H2O2 and 5 mg (CCLH 120) following the pseudo-first order kinetics.

Table S1: Description of RhB degraded at different time intervals and calculations of rate constants for different Co(II)Co(III) LDHs.

Co LDH synthesized	Degradation time(min)	Percentage of dye degraded	Rate Constants (min^{-1})
CCLH (110°C)	20	16	6.20 x 10^{-3}
	60	22	
	120	54	

CCLH (120°C)	20	37	5.16×10^{-2}
	60	68	
	120	95	
CCLH (130°C)	20	34	3.53×10^{-2}
	60	54	
	120	75	
CCLH (n-Butanol)	20	34	1.15×10^{-2}
	60	54	
	120	75	
CCLH (H_2O)	20	8	3.50×10^{-3}
	60	24	
	120	36	

Table S2: Description of degradation efficiencies of CCLH (120) for different dyes at different time intervals.

Degradation time(min)	**Percentage of RhB degraded**	**Percentage of MB degraded**	**Percentage of MO degraded**
05	27	67	22
10	70	77.3	34
35	95	**97**	77

Table S3: Calculations of rate constants and wavelength maxima shift for different dyes using CCLH (120).

Dyes	**Rate Constants (min^{-1})**
RhB	8.40×10^{-2}
MB	8.64×10^{-2}
MO	3.94×10^{-2}