Removal of Ferric Iron from Aqueous Solution by Adsorption onto MOF-FeBDC-EDTA

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Supplementary Information

Experimental

The concentration of residual Fe^{3+} in the sorption medium was determined by the spectrophotometric method. Fe^{3+} ion forms the complex with sulfosalicylic acid reagent in the alkaline medium (pH 9 – 10), then the absorbance of the complex was measured at λ_{max} = 425 nm.

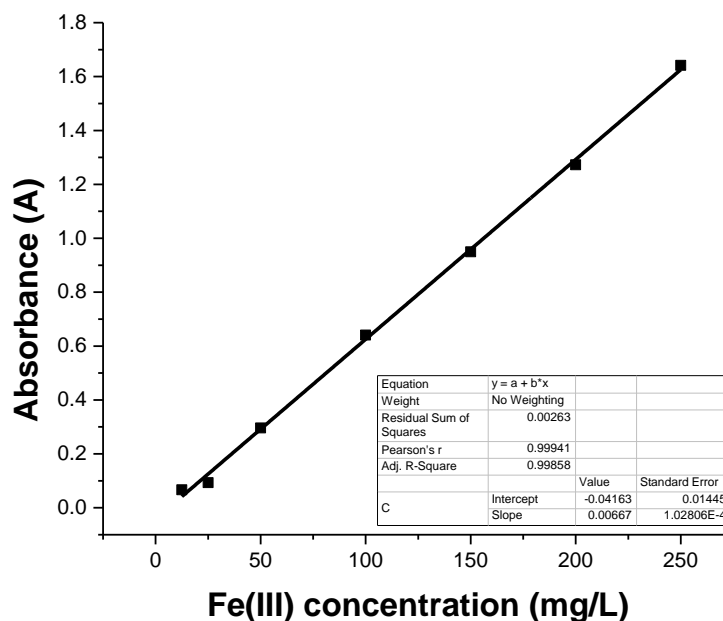| Equation	y = a + b*x		
Weight	No Weighting		
Residual Sum of Squares	0.00263		
Pearson's r	0.99941		
Adj. R-Square	0.99858		
		Value	Standard Error
C	Intercept	-0.04163	0.01445
	Slope	0.00667	1.02806E-4

Fig 1: Calibration curve for the determination of residual Fe^{3+} in the sorption medium

Results and discussion
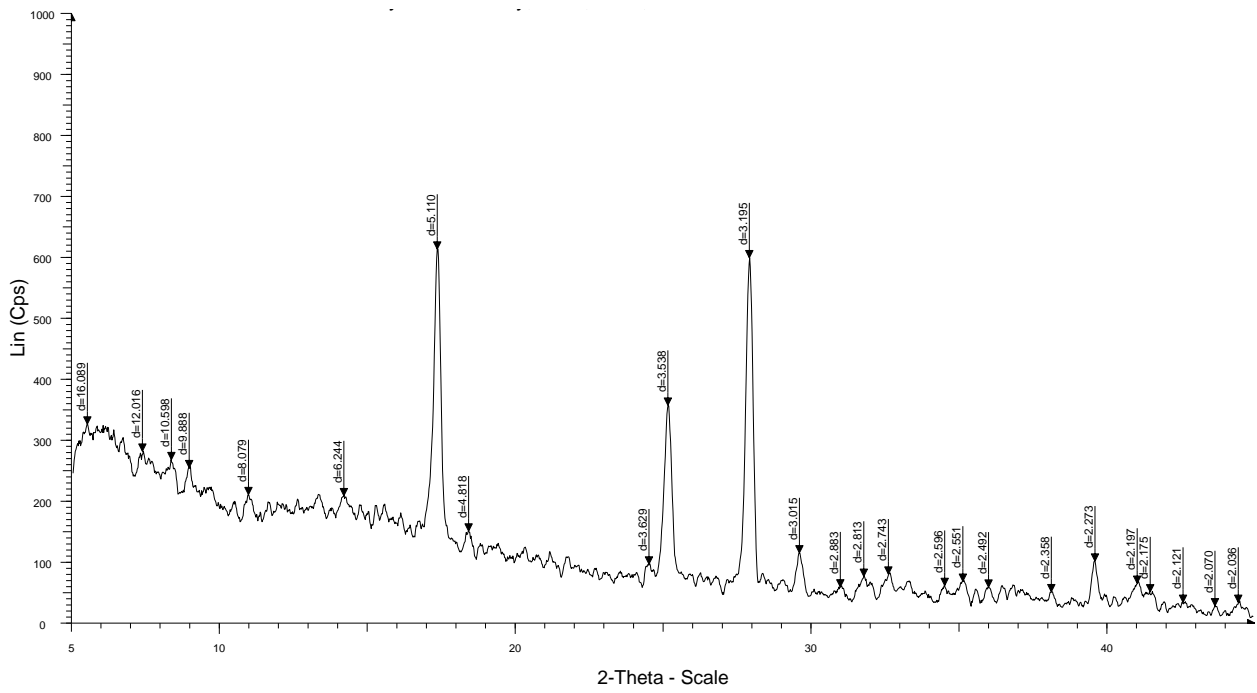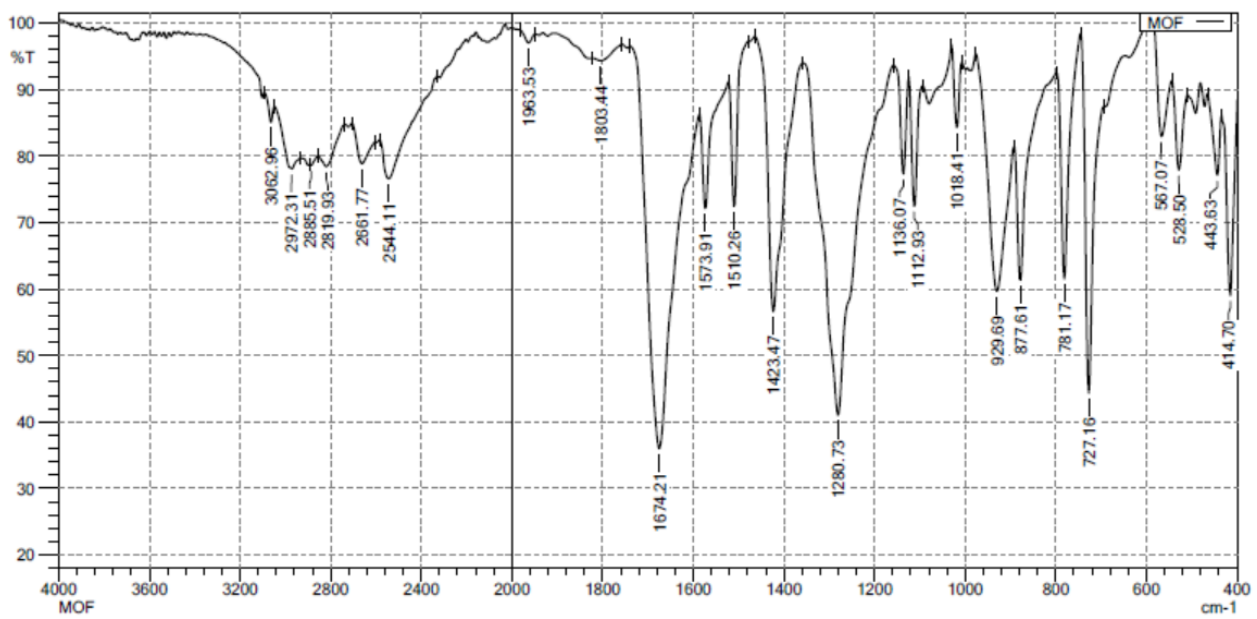
Characterization
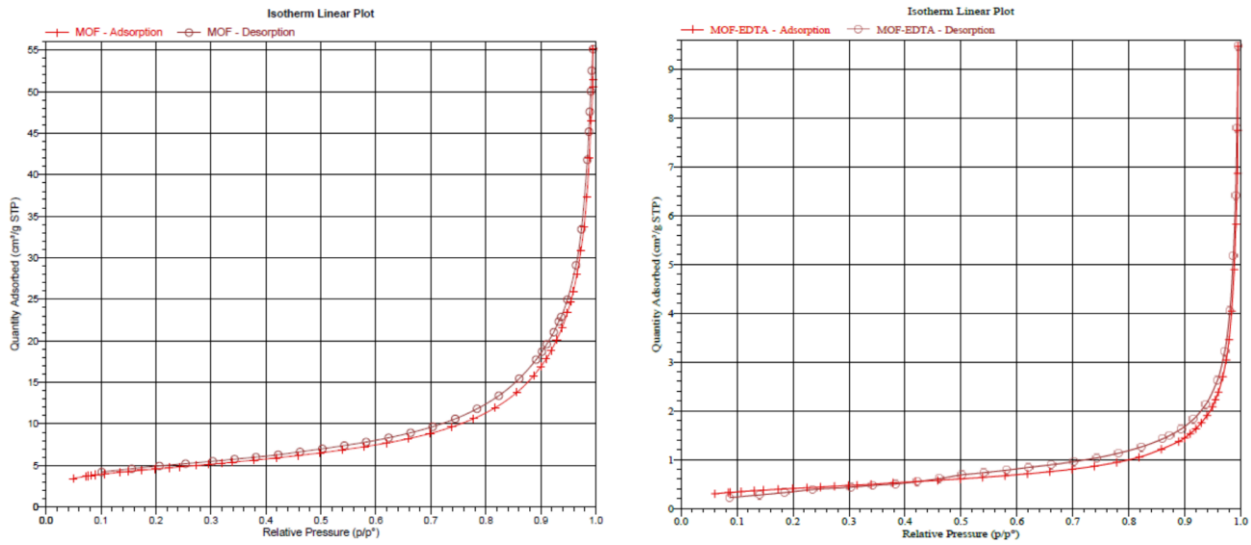
Fig 2: XRD diagram of MOF-FeBDC

Fig 3: IR spectrum of MOF-FeBDC

Fig 4: N$_2$ adsorption-desorption isotherms of MOF-FeBDC (left) and FeBDC-EDTA (right)

Table 1: Parameter of N$_2$ adsorption-desorption isotherms

	MOF FeBDC	MOF FeBDC-EDTA
BET surface area (m^2/g)	16.1066	1.4923
Pore size (nm)	19.54784	34.59630

Adsorption Isotherm

Table 2: Experimental data for estimation of Isotherm parameters

C_i	mass of the adsorbent	A	C_e	MR %	q_e (mg/g)	C_e/q_e	logC_e	logq_e
50		4.51E-03	6.882299	86.23540	86.2354	0.079808	0.837734	1.935686
100		7.59E-02	17.53731	82.46269	164.9254	0.106335	1.243963	2.217287
150	500 mg	0.42411	69.50896	53.66070	160.9821	0.431781	1.842041	2.206778
200		0.62403	99.34776	50.32612	201.3045	0.49352	1.997158	2.303853
250		0.83754	131.2149	47.51403	237.5701	0.552321	2.117983	2.375792

Table 3: Estimated equilibrium parameter (R_L)

C_i (mg/L)	50	100	150	200	250
R_L	0.2457	0.1400	0.0979	0.0753	0.0612