

SUPPLEMENTARY MATERIALS

Cellulose-based hydrogel for adsorptive removal of cationic dyes from aqueous solution: Isotherms and Kinetics

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Supplementary Table 1. ANOVA and coefficients model for the CV removal process

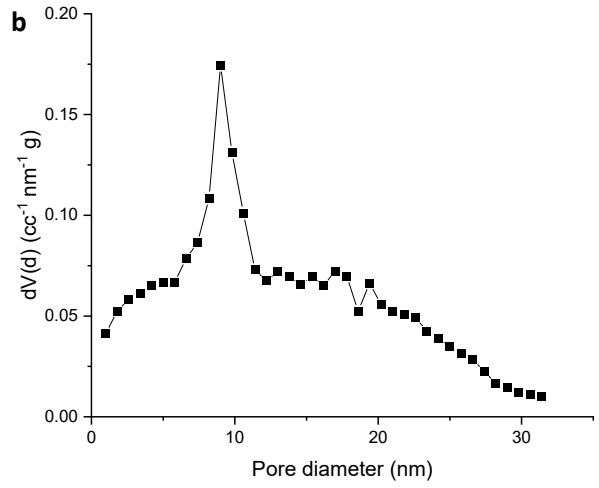
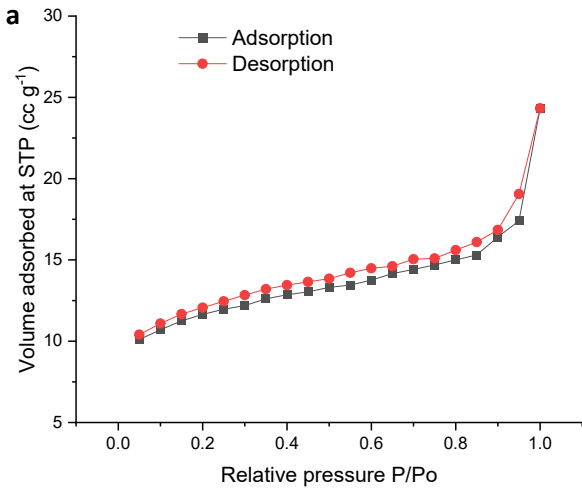
Source	Sum of Squares	df	Mean Square	F-value	p-value	Significant/ Non-significant
Model	89.18	14	6.37	85.19	< 0.0001	S
A	43.19	1	43.19	577.57	< 0.0001	S
B	6.14	1	6.14	82.12	< 0.0001	S
C	7.16	1	7.16	95.80	< 0.0001	S
D	0.48	1	0.48	6.40	0.0299	S
AB	0.34	1	0.34	4.56	0.0585	NS
AC	0.99	1	0.99	13.30	0.0045	S
AD	0.00	1	0.00	0.01	0.9411	NS
BC	1.08	1	1.08	14.41	0.0035	S
BD	0.80	1	0.80	10.69	0.0084	S
CD	0.04	1	0.04	0.53	0.4826	NS
A ²	2.67	1	2.67	35.75	0.0001	S
B ²	0.03	1	0.03	0.36	0.5642	NS
C ²	1.42	1	1.42	18.96	0.0014	S
D ²	1.09	1	1.09	14.62	0.0034	S
Residual	0.75	10	0.07			
Lack of Fit	0.24	4	0.06	0.70	0.6204	NS
Pure Error	0.51	6	0.09			
Cor Total	89.93	24				
CV = 0.30 %	R² = 0.99	Adj R² = 0.98	Pred R² = 0.87	Adeq. Precision = 33.82		

*S-Significant; NS-Non-significant

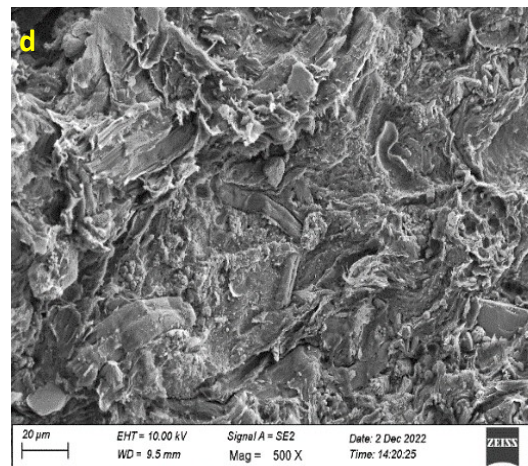
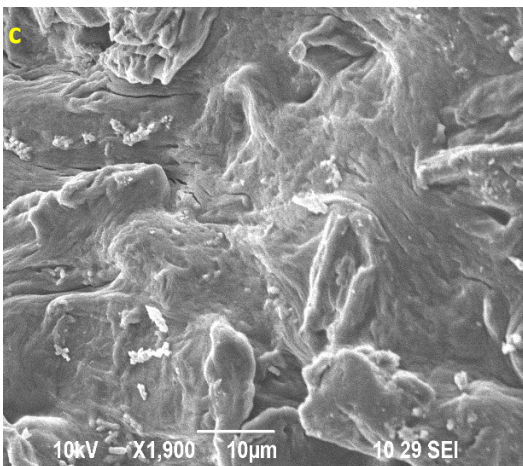
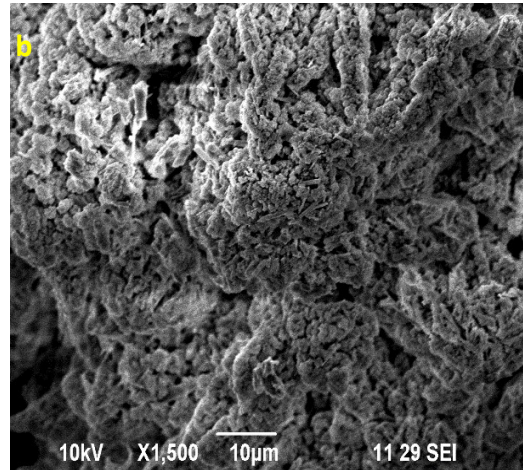
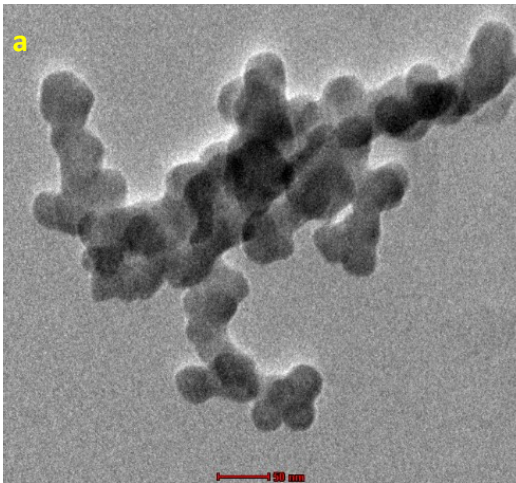
Supplementary Table 2. ANOVA and coefficients model for the MB removal process

Source	Sum of Squares	df	Mean Square	F-value	p-value	Significant/ Non-significant
Model	534.03	14	38.14	30.55	< 0.0001	S
A	60.60	1	60.60	48.53	< 0.0001	S
B	28.27	1	28.27	22.64	0.0008	S
C	2.79	1	2.79	2.24	0.1655	NS
D	14.61	1	14.61	11.70	0.0065	S
AB	64.30	1	64.30	51.50	< 0.0001	S
AC	29.92	1	29.92	23.96	0.0006	S
AD	8.00	1	8.00	6.40	0.0298	S
BC	63.52	1	63.52	50.87	< 0.0001	S
BD	0.33	1	0.33	0.26	0.6206	NS
CD	0.01	1	0.01	0.01	0.9233	NS
A ²	4.24	1	4.24	3.39	0.0952	NS
B ²	24.66	1	24.66	19.75	0.0012	S
C ²	7.75	1	7.75	6.20	0.032	S
D ²	0.00	1	0.00	0.00	0.9818	NS
Residual	12.49	10	1.25			
Lack of Fit	11.90	8	1.49	5.05	0.1759	NS
Pure Error	0.59	2	0.29			
Cor Total	546.51	24				
CV = 1.26 %	R² = 0.98	Adj R² = 0.94	Pred R² = 0.81	Adeq. Precision = 23.06		

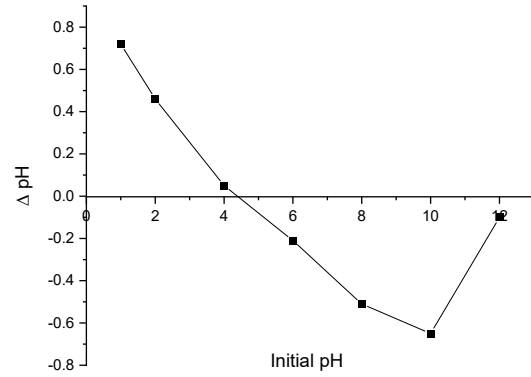
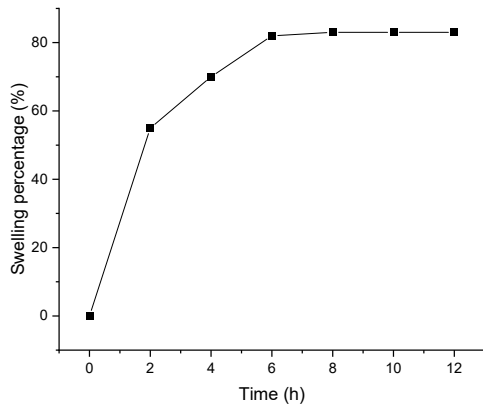
*S-Significant; NS-Non-significant



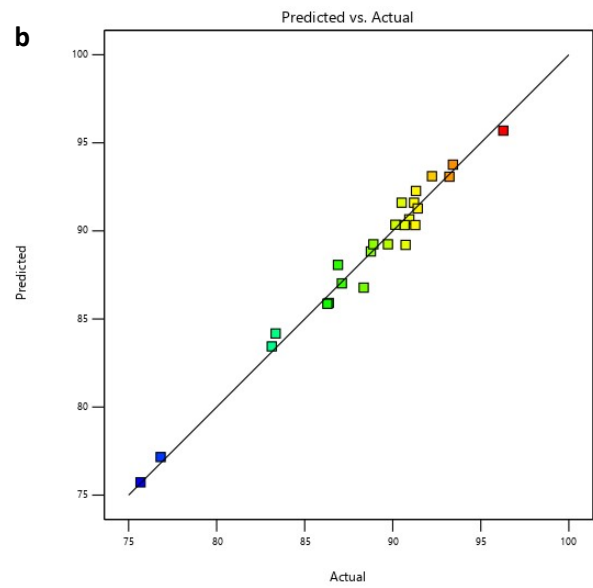
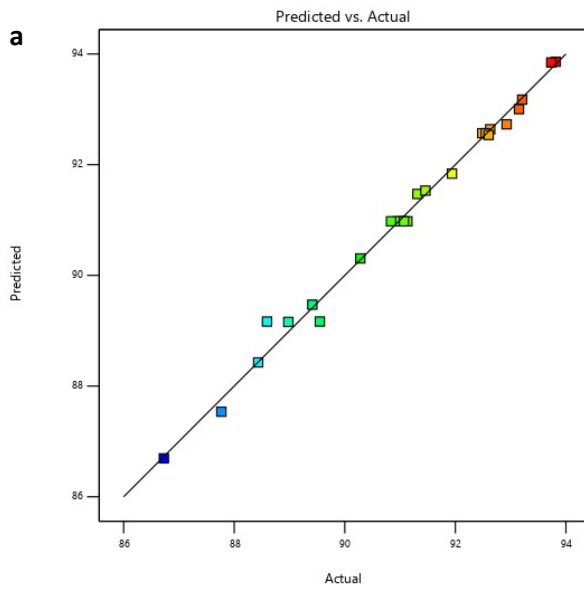
Supplementary Figure 1. (a) BET nitrogen adsorption isotherm plot (b) Pore size distribution plot



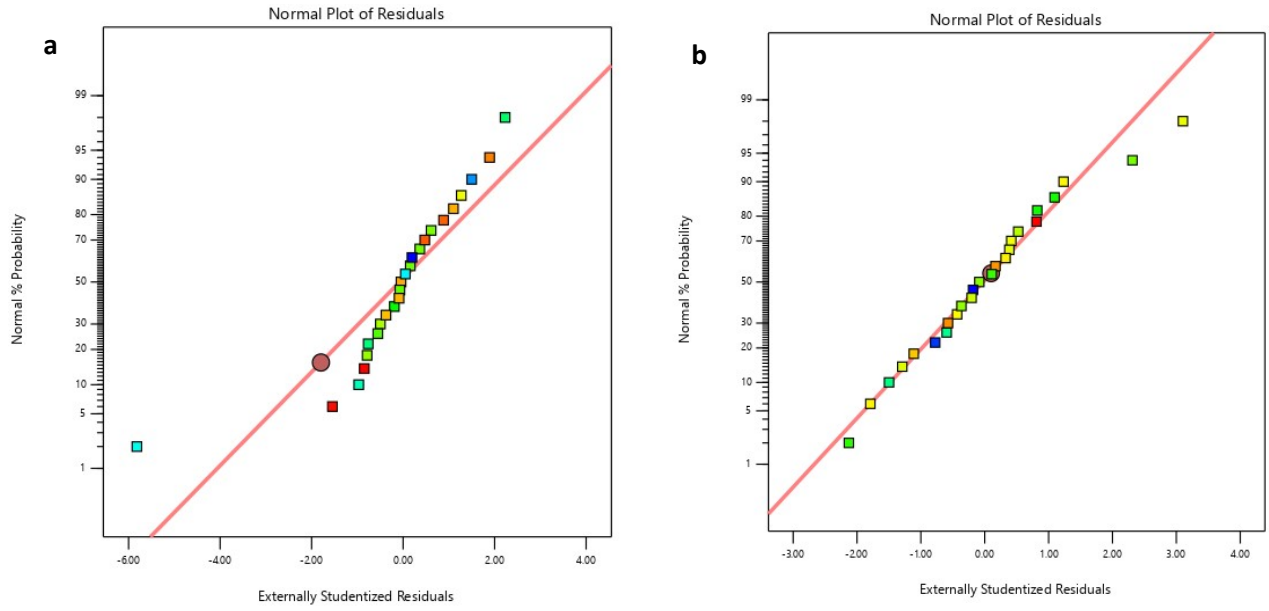
Supplementary Figure 2. (a) TEM micrograph of NCC and SEM micrographs of NCC-CH hydrogel bead (b) before adsorption (c and d) after adsorption.



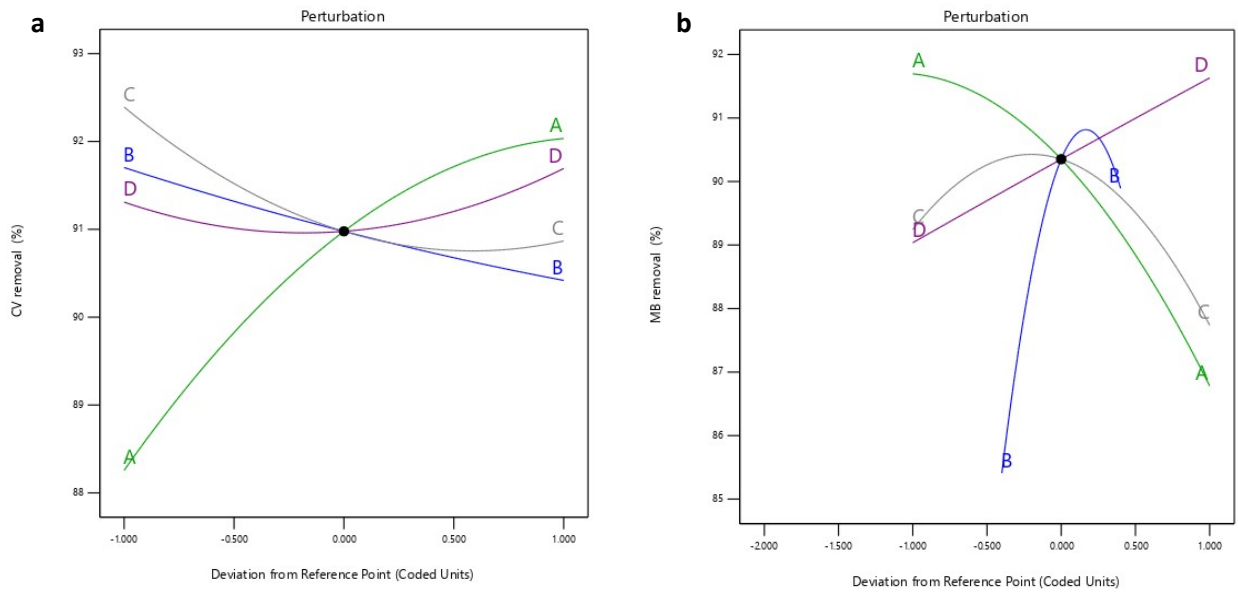
Supplementary Figure 3. (a) Point of zero charge and (b) Swelling ratio of NCC-CH hydrogel bead.



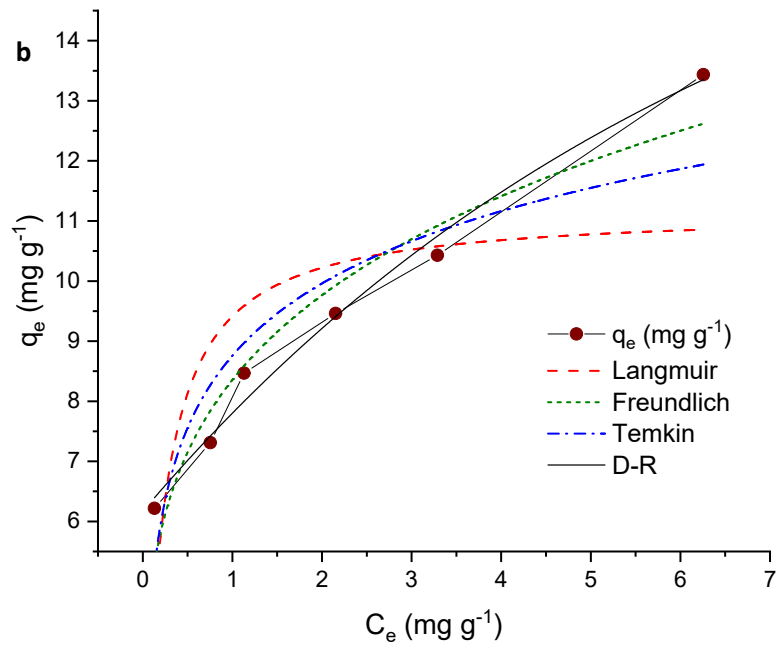
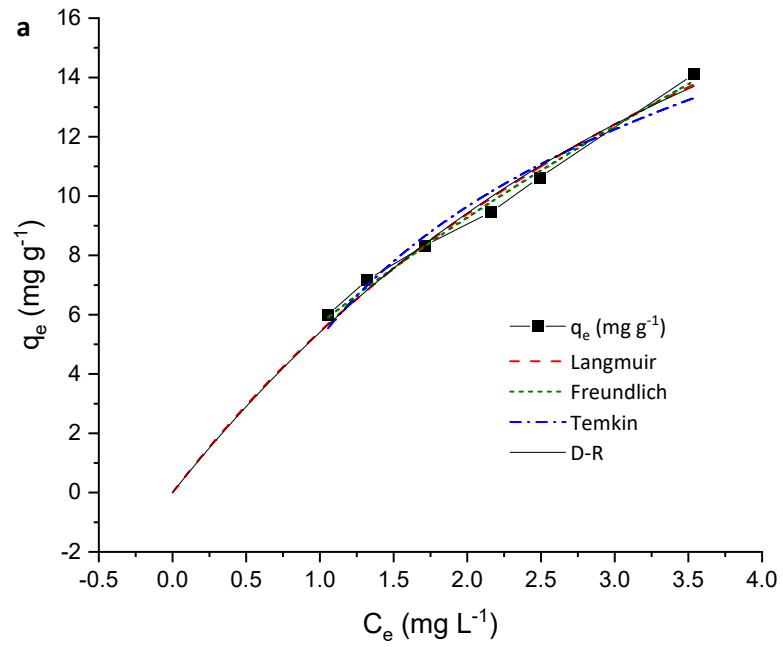
Supplementary Figure 4. Predicted vs Experimental plots (a) CV removal and (b) MB removal



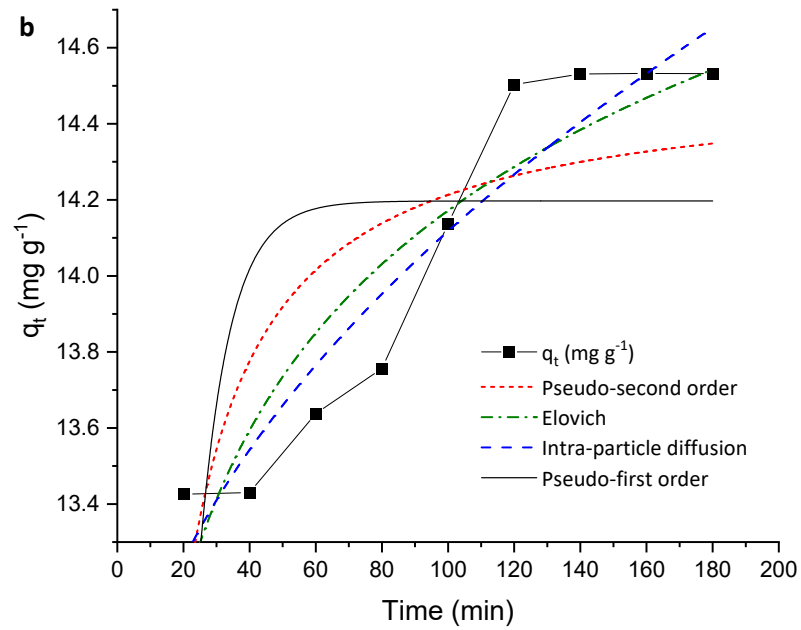
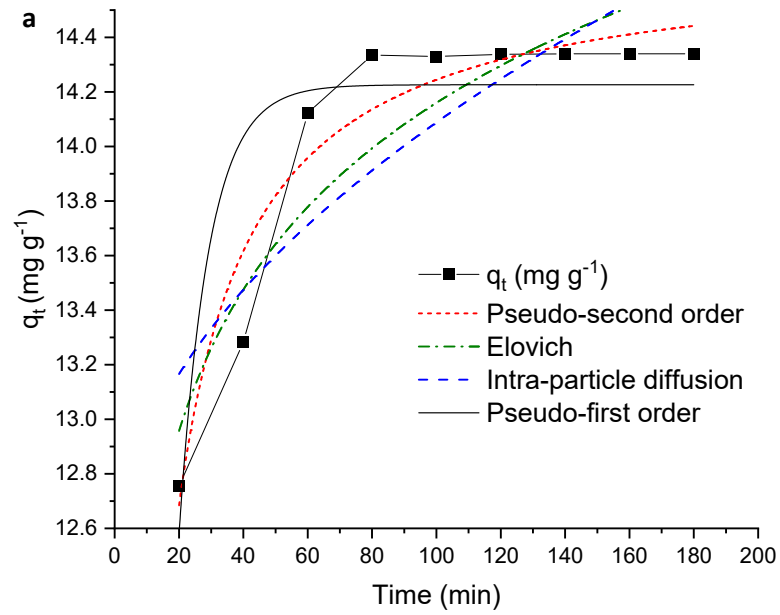
Supplementary Figure 5. Normal plot of residuals (a) CV removal and (b) MB removal



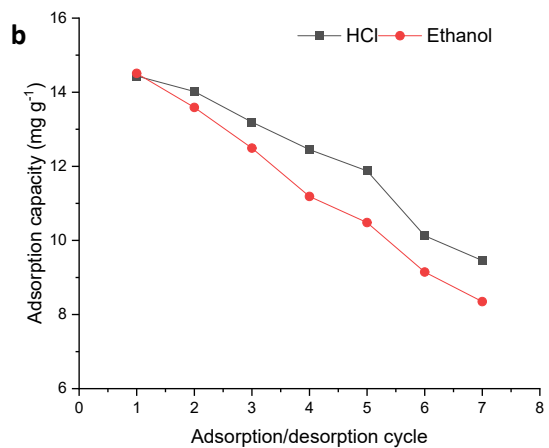
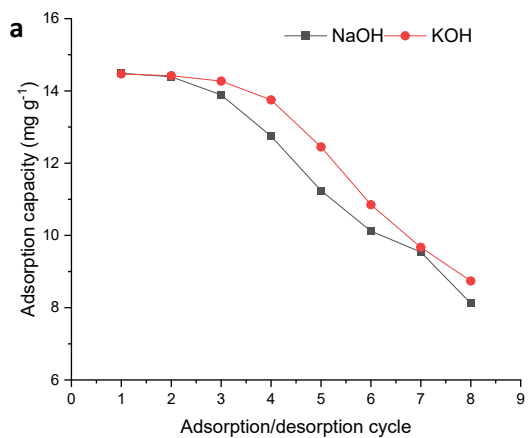
Supplementary Figure 6. Perturbation plot (a) CV removal and (b) MB removal



Supplementary Figure 7. Adsorption isotherm models for CV (a) and MB (b) removal



Supplementary Figure 8. Adsorption kinetic models for CV (a) and MB (b) removal



Supplementary Figure 9. Adsorption capacity of NCC-CH in adsorption/desorption cycles (a) CV adsorption and (b) MB adsorption