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Title: Assessment of halloysite clay nanotubes as adsorbents for removing tetracycline hydrochloride from contaminated aqueous systems via experimental study and SQM calculations.

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SUPPLEMENTARY MATERIAL ES1

Table S1: Band assignments of vibrations of halloysite FTIR spectra.

Vibrations	Wavelength (cm^{-1})
Stretching of the O-H outer surface	3692
O-H internal stretch	3621
C-H_2 symmetric stretch	2930
O-H deformation in H_2O	1653
C-H_3 deformation (scissors)	1266
Si-O-Si angular deformation	998
Al_2-OH deformation	910
O-H vibrations	755
Si-O-Si angular deformation	684
Al-O-Si out-of-plane deformation	529
Si-O deformation	458

Figure S1: EDX mapping images for (A) Hal; (B) Hal-A1 and (C) Hal-A5.

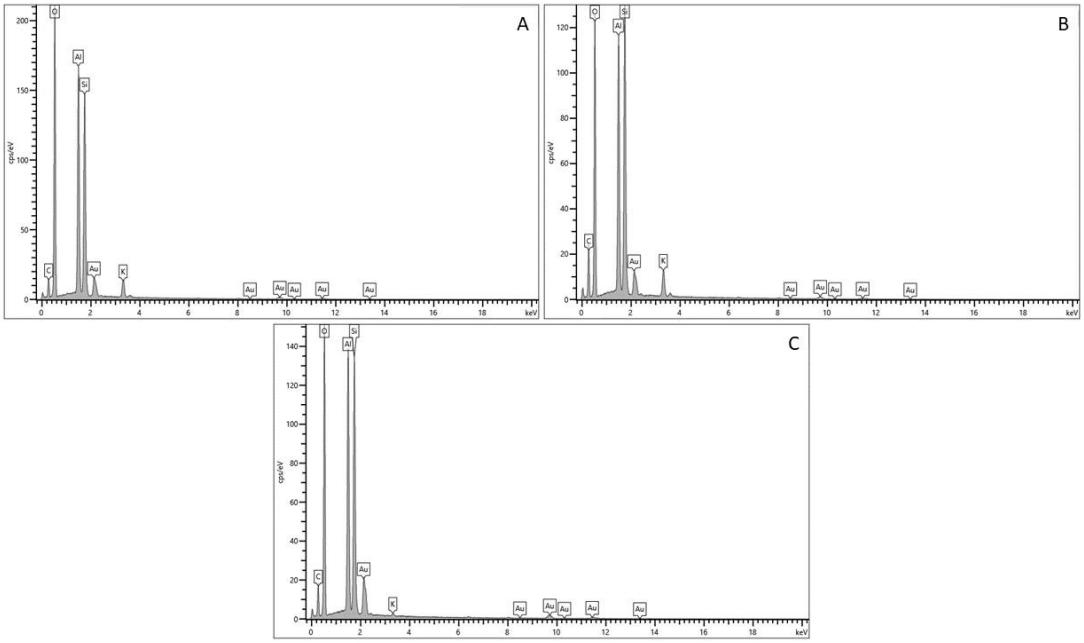


Figure S2: Adsorption graph (%) predicted versus real.

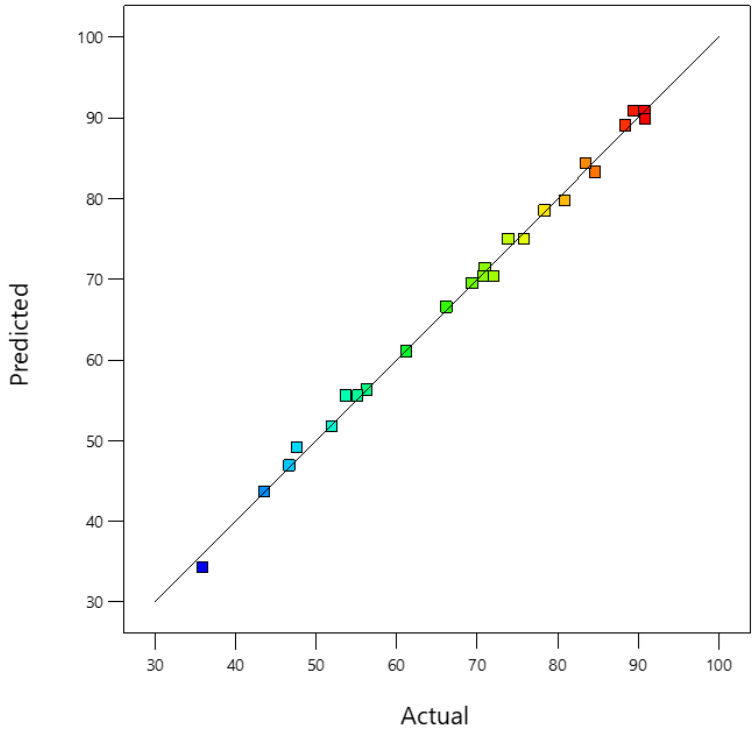


Figure S3: Adsorption graph normal plot of residuals.

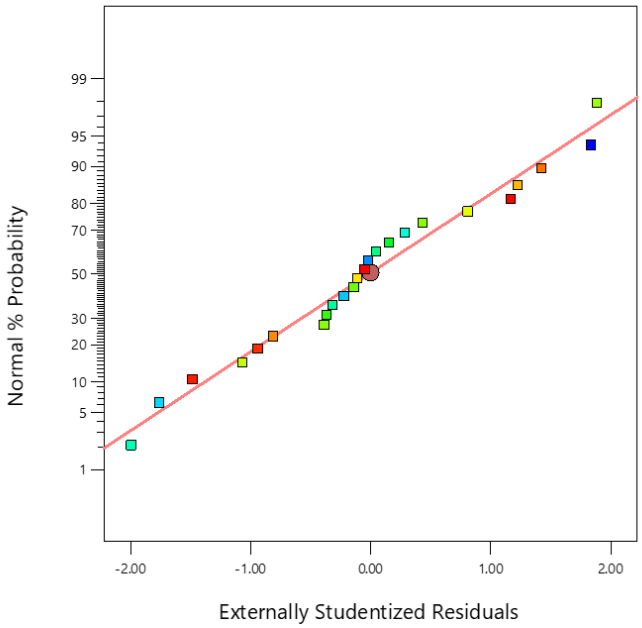


Figure S4: Adsorption graph residuals versus Predicted.

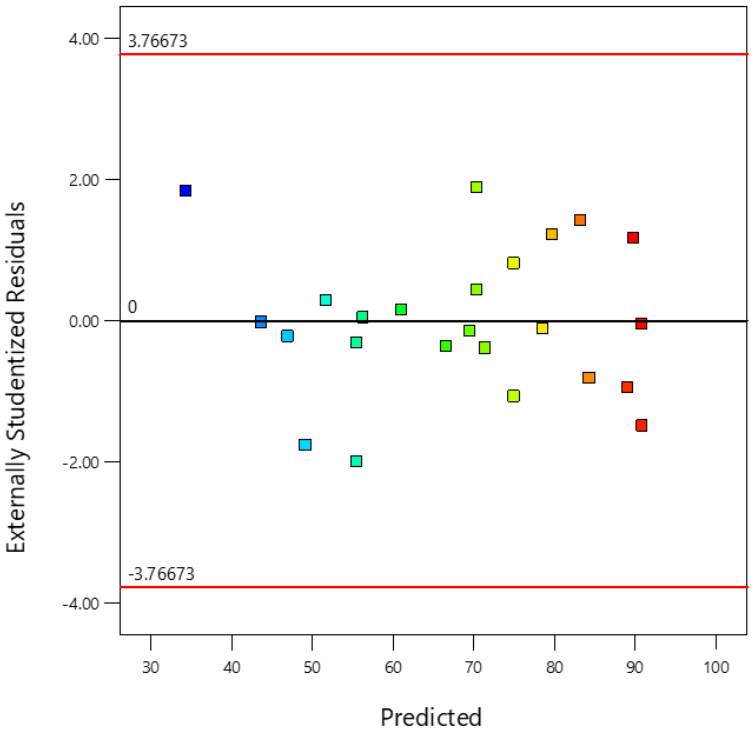


Figure S5: Adsorption graph residual versus run.

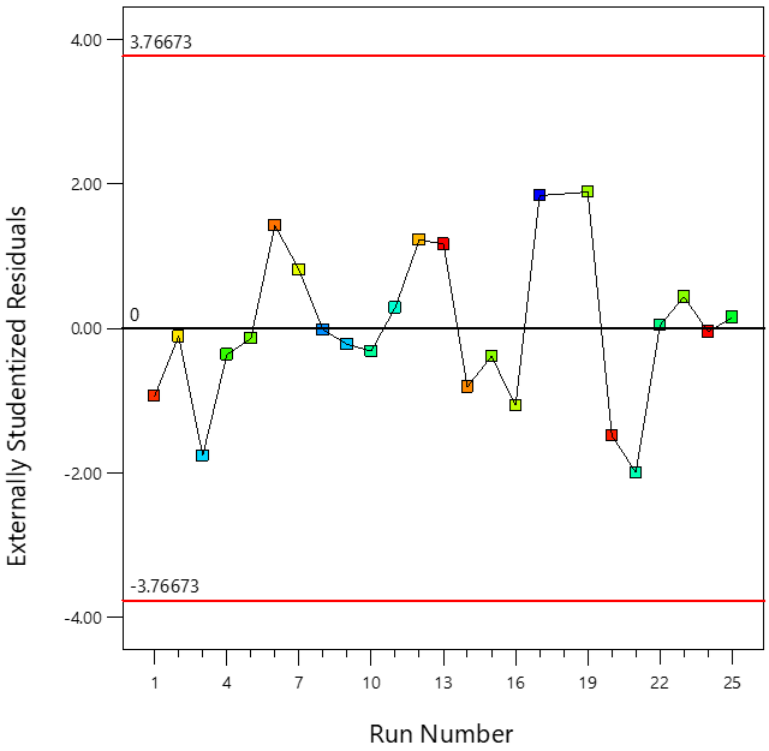


Figure S6: Adsorption graph cook's distance

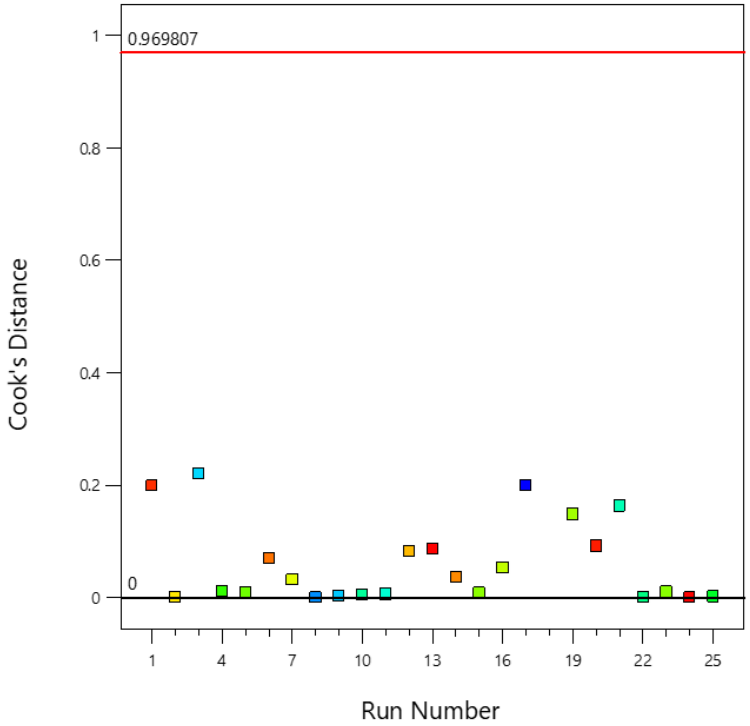


Figure S7: Adsorption graph Box-Cox plot for power transforms.

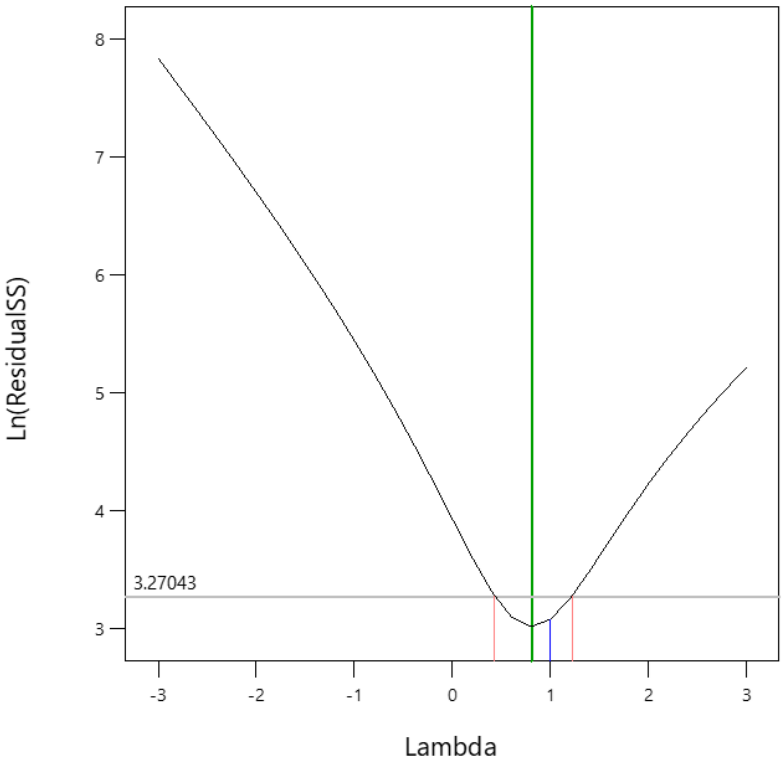


Figure S8: Adsorption graph residual versus A:time (min)

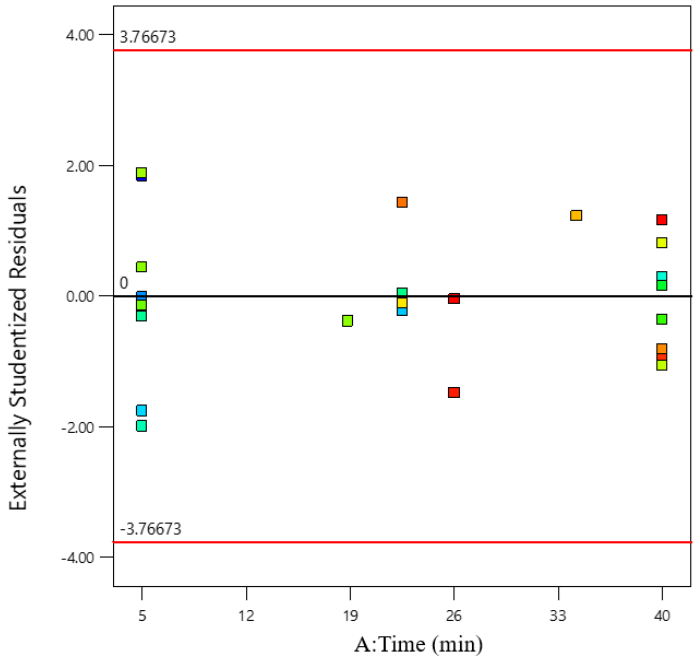


Figure S9: Adsorption graph Leverage versus run.

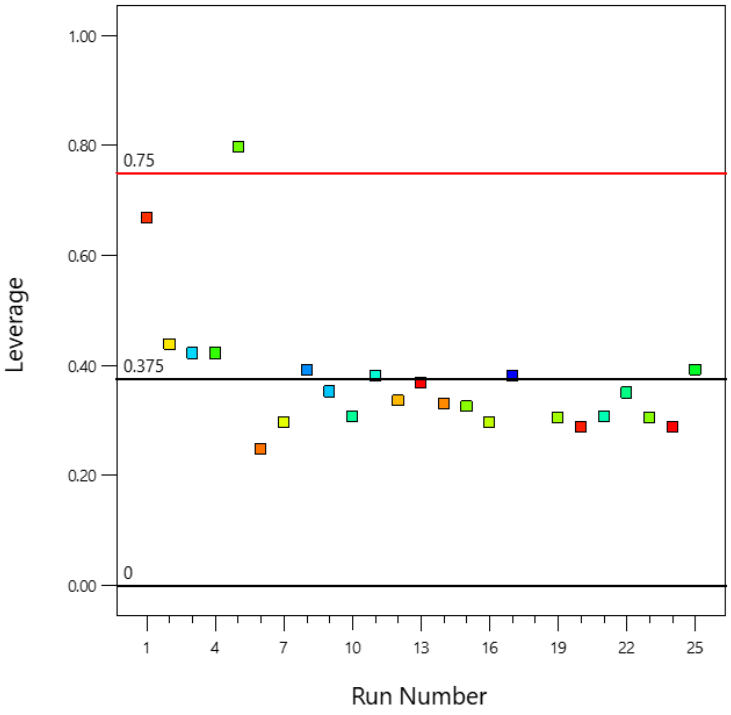


Figure S10: Adsorption graph DFFITS versus RUN.

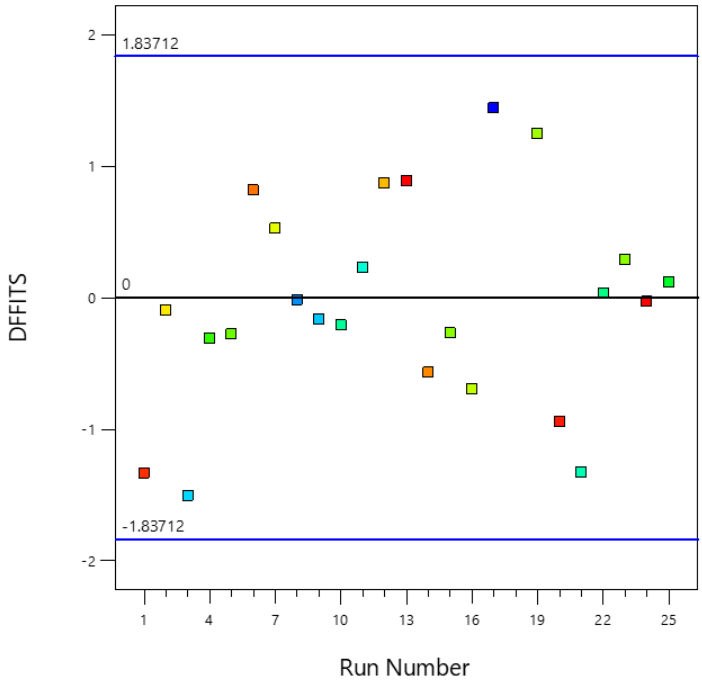
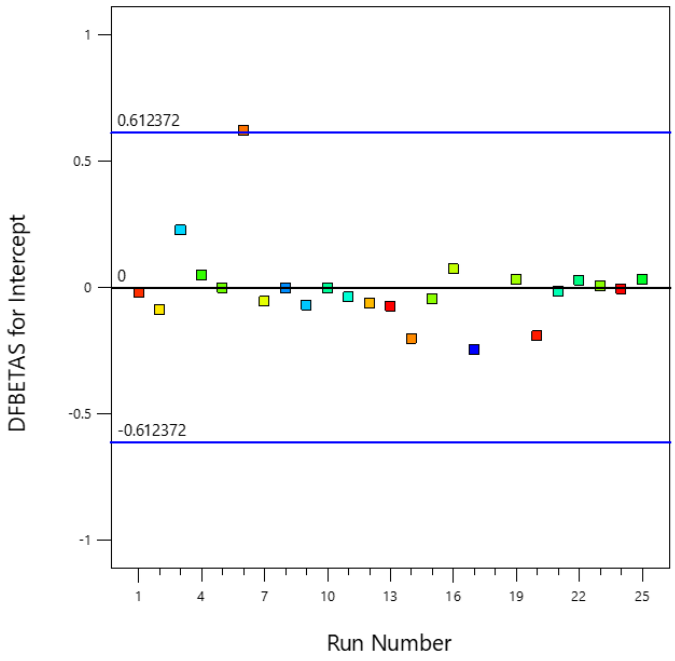


Figure S11: Adsorption graph DFBETAS for Intercept versus run.



$$Ads(Hal - N) = -21{,}840 + 1{,}073A + 227{,}929B - 0{,}013A^2 - 192{,}259B^2 \quad \textbf{Eq. S1}$$

$$Ads(Hal - A1) = 1{,}883 + 1{,}219A + 227{,}929B - 0{,}013A^2 - 192{,}259B^2 \quad \textbf{Eq. S2}$$

$$Ads(Hal - A5) = -0{,}887 + 1{,}131A + 227{,}929B - 0{,}013A^2 - 192{,}259B^2 \quad \textbf{Eq. S3}$$

Table S2: Parameters of the isotherms for drug adsorption using Hal and Hal-A1 in 298.15 K.

Isoterms parameters	Hal	Hal-A1
Langmuir		
q_m ($mg.g^{-1}$)	7.428	9.929
K_L ($L.mg^{-1}$)	0.234	0.130
R^2	0.925	0.990
Freundlich		
K_F ($mg.g^{-1}(mg.L^{-1})^{-1}/n$)	2.268	2.836
P	3.285	4.344
R^2	0.9758	0.775
Sips		
Qmáx ($mg.g^{-1}$)	9.895	9.882
K_S ($(mg.L^{-1})^{-1}/n$)	0.016	0.147
N	0.379	1.079
R^2	0.9832	0.9896
Temkin		
A	3.994	2.376
B	1.340	1.613
R^2	0.9755	0.9058

Figure S12: Isotherm models for drug removal in aqueous solutions using Hal-A1 (A) and Hal (B).

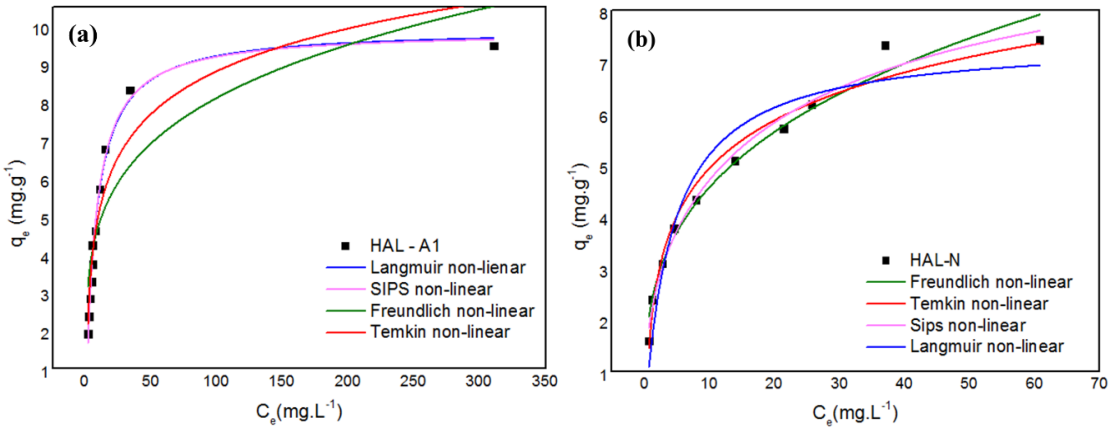


Figure S13: Van't Hoff plot of tetracycline adsorption with Hal-A1.

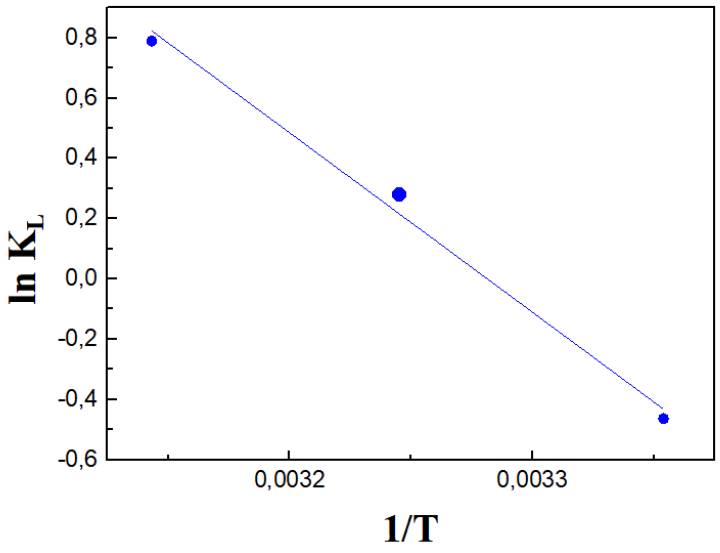


Figure S14: Reuse of (a) Hal and (b) Hal-A1 after tetracycline adsorption cycles.