# Gel-Inspired Trapping Networks: Fe(III)-Activated Palygorskite Nanorod Aggregates for Enhanced Congo Red Sequestration

Hao Chen *, Yufan Song

*School of Pharmaceutical and Chemical Engineering, Taizhou University, Shifu Road No. 1139, Taizhou 318000, Zhejiang, PR China*

*Corresponding author. Tel.: +86-576-85137265; Fax: +86-576-85137182;

E-mail address: chenhao2212@sohu.com

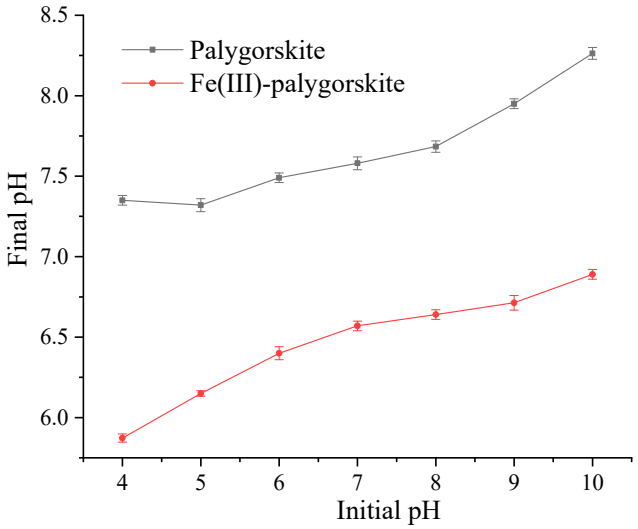



**Figure S1.** Changes in pH of dye solution before and after adsorption.

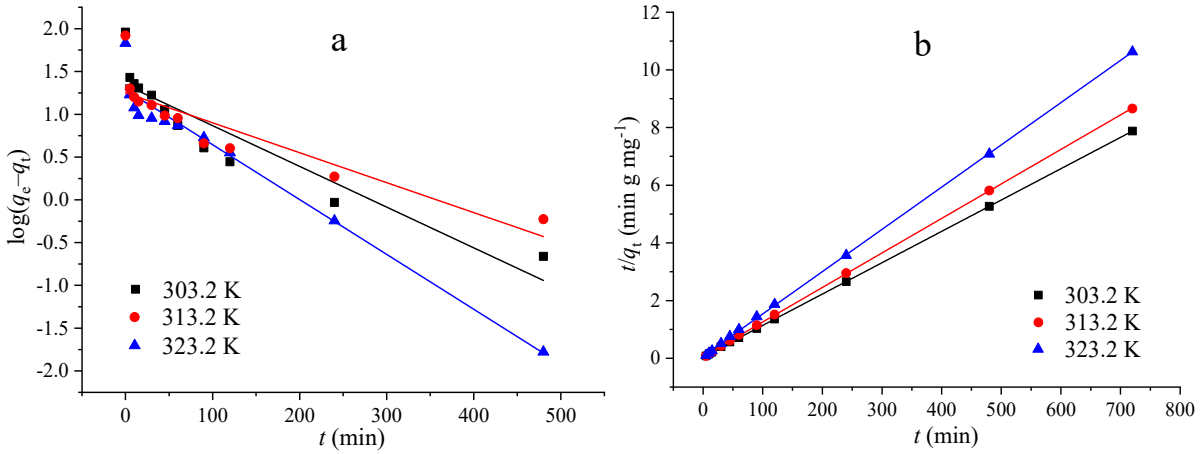



**Figure S2.** Pseudo-first-order (a) and pseudo-second-order (b) kinetic plots for the adsorption of CR onto Fe(III)-activated palygorskite at different temperatures.

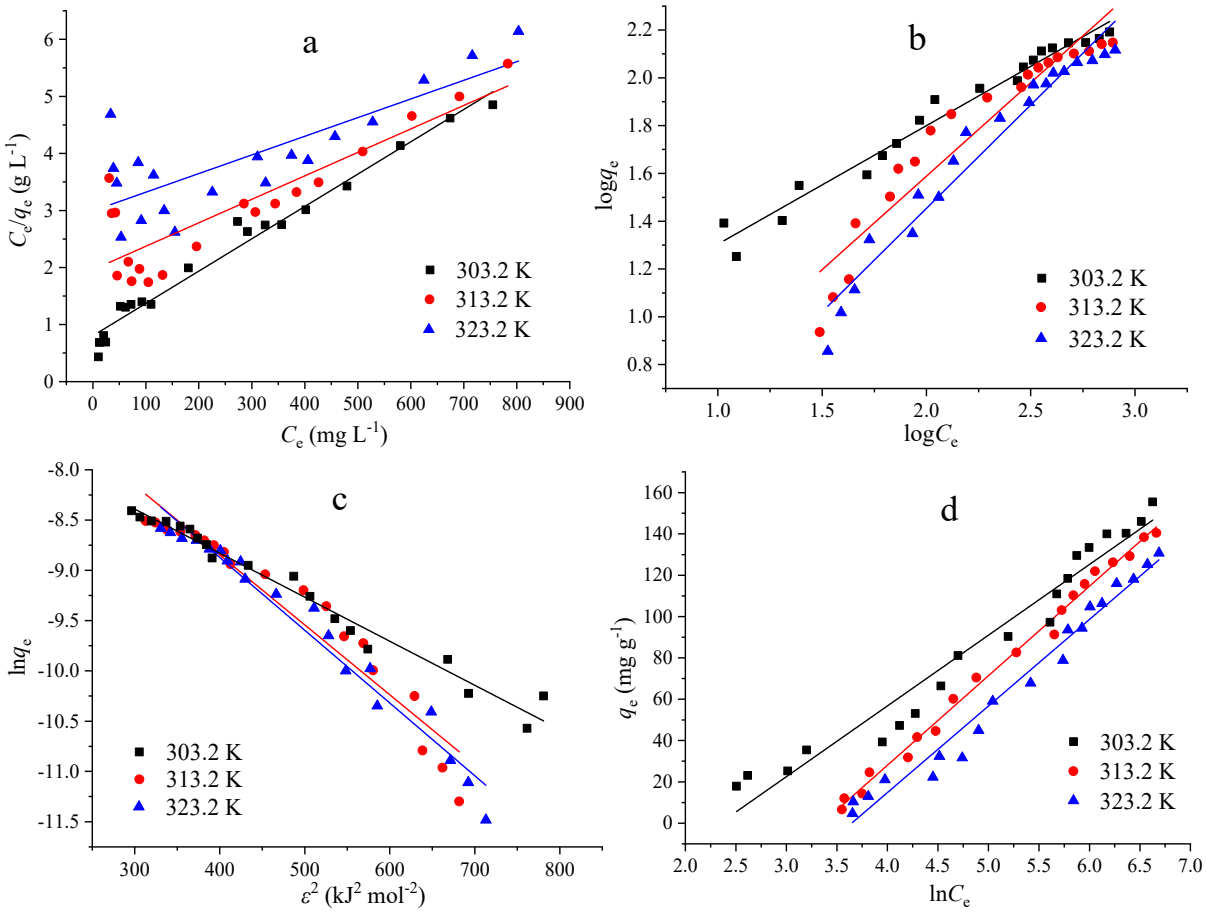



**Figure S3.** Langmuir (a), Freundlich (b), D-R (c), and Temkin (d) plots for the adsorption of CR onto Fe(III)-activated palygorskite at different temperatures.

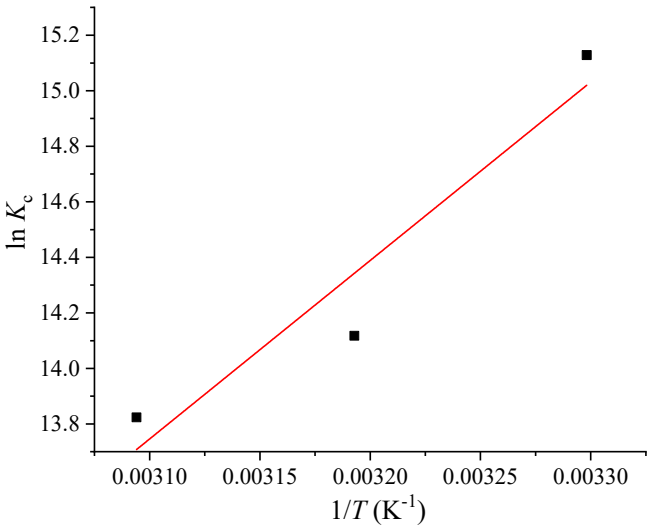



**Figure S4.** Van't Hoff plot for CR adsorption on Fe(III)-activated palygorskite.

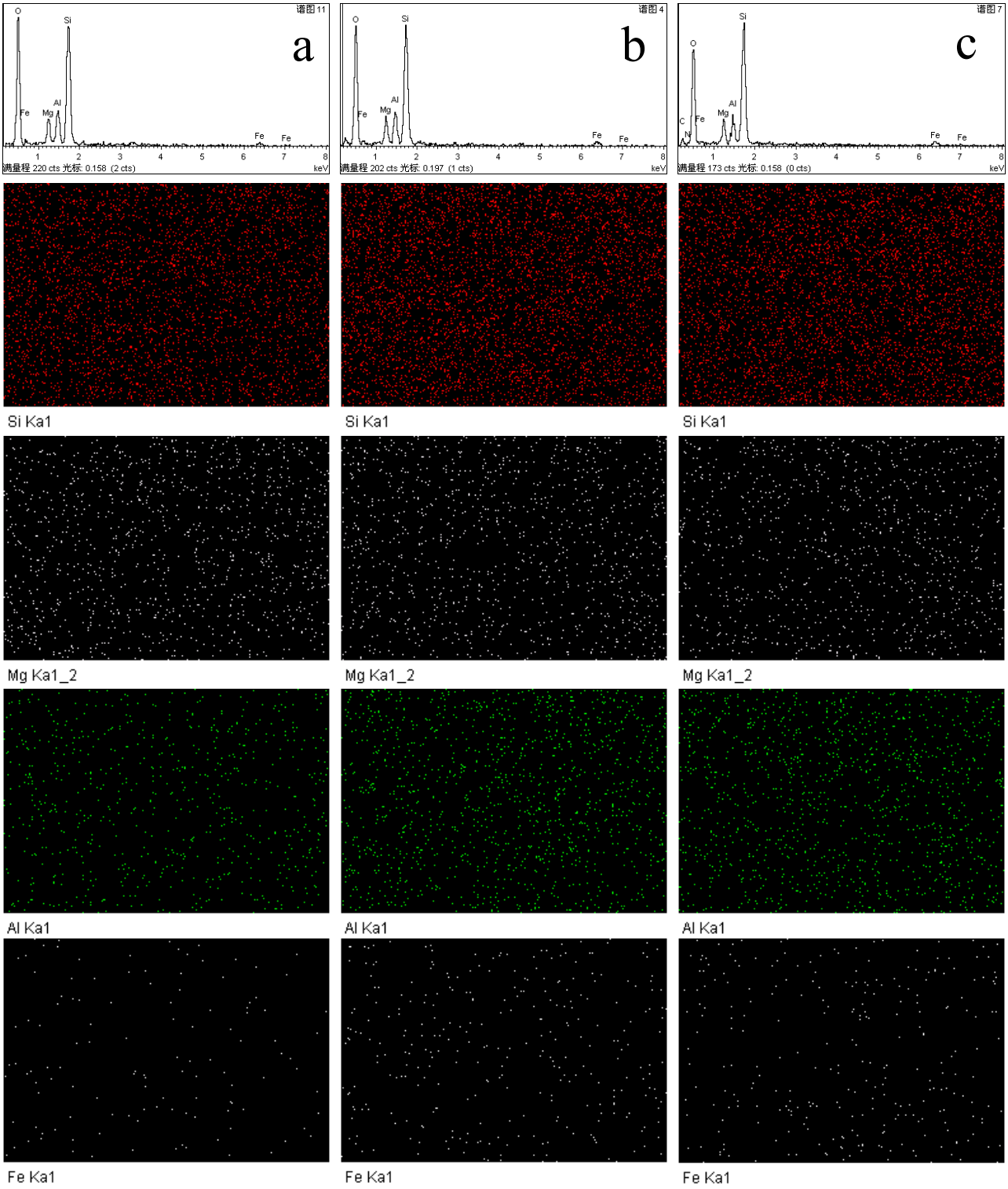



**Figure S5.** EDS images and elemnt-mapping of palygorskite (a), Fe(III)-palygorskite (b) and dye loaded Fe(III)-palygorskite (c).

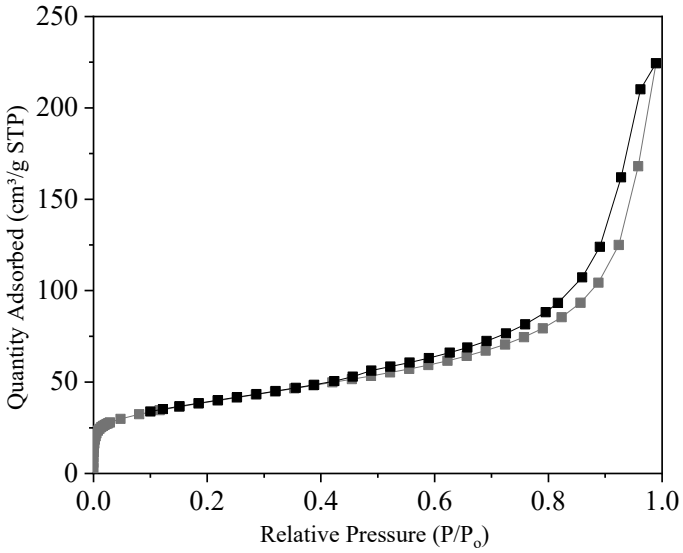



**Figure S6.** Nitrogen adsorption-desorption isotherm of Fe(III)-activated palygorskite.

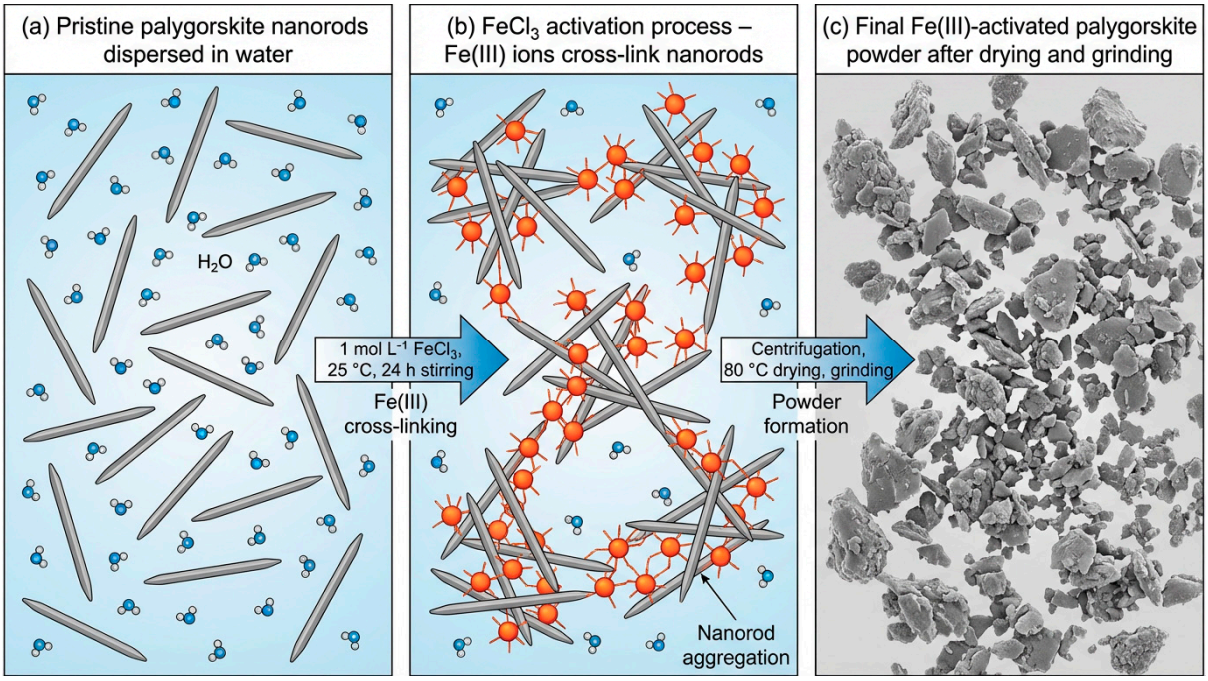



**Figure S7.** Schematic illustration of the synthesis procedure of Fe(III)-activated palygorskite.

**Table S1.** Iron ion concentration in the supernatant after dye adsorption.

| *T* (K) | Palygorskite | Fe(III)-activated palygorskite |
|---|---|---|
| 303.2 | 0.06±0.03 | 0.69±0.09 |
| 313.2 | 0.07±0.02 | 0.46±0.06 |
| 323.2 | 0.07±0.03 | 0.32±0.05 |

**Table S2.** The positions of the characteristic diffraction peaks of the three samples in the XRD patterns.

| Crystal plane | (110) | (200) | (130) | (040) | (240) | (400) |
|---|---|---|---|---|---|---|
| Palygorskite | 8.413 | 13.766 | 16.394 | 19.813 | 24.222 | 27.538 |
| Fe(III)-palygorskite | 8.355 | 13.864 | 16.495 | 19.812 | 24.220 | 27.616 |
| Dye loaded Fe(III)-palygorskite | 8.335 | 13.648 | 16.472 | 19.811 | 24.379 | 27.437 |