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Electronic Supplementary Information

Preparation of Magnetic Calcium Silicate Hydrate for the Efficient Removal of Uranium from Aqueous Systems

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1. Sorption isotherms

All adsorption data are fitted to the Langmuir and Freundlich models as shown in Figure S1 and Figure S2. The relative parameters of were calculated show that the Langmuir isotherm is more suitable to characterize the uranium sorption behavior on MCSH than the Freundlich model.

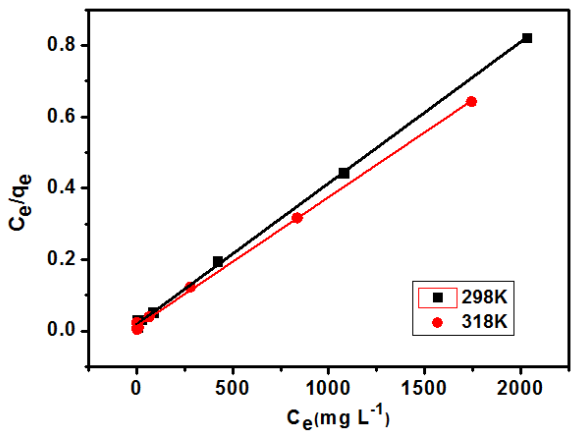


Fig. S1. Langmuir isotherm for removal of uranium by MCSH.

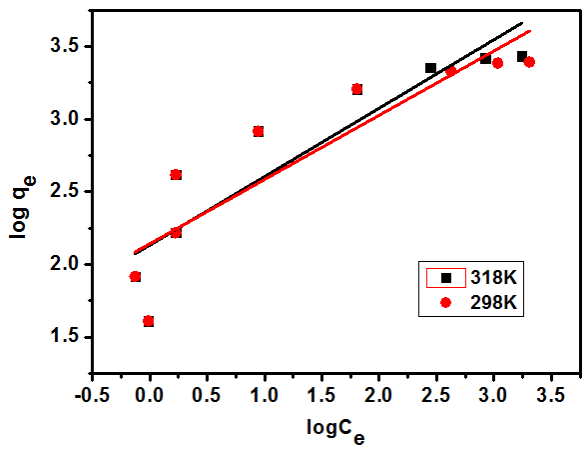


Fig. S2. Freundlich isotherm for removal of uranium by MCSH.

The values of $\Delta H°$ and $\Delta S°$ are calculated from the slope and intercept of the linear regression of ln K_L *versus* $1/T$ (Figure S3).

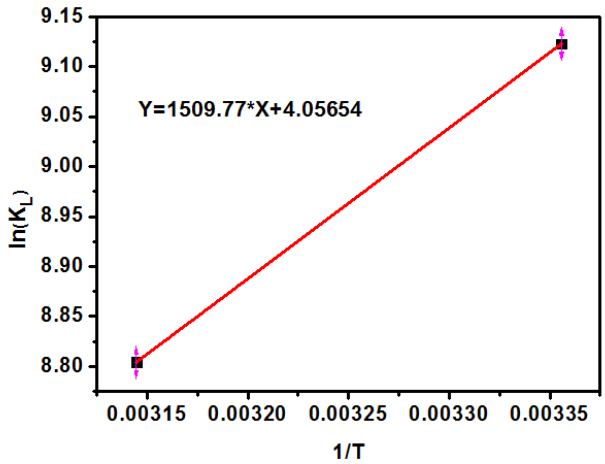


Fig. S3. Van't Hoff plot for removal of uranium by MCSH.

2 Adsorption kinetics

The linear plots of uranium adsorption kinetics to the pseudo-first-order model and the pseudo-second-order model are given in Figure S4 and Figure S5, respectively. It is observed that the correlation coefficients for the pseudo-second-order model are higher compared to those for the pseudo-first-order model.

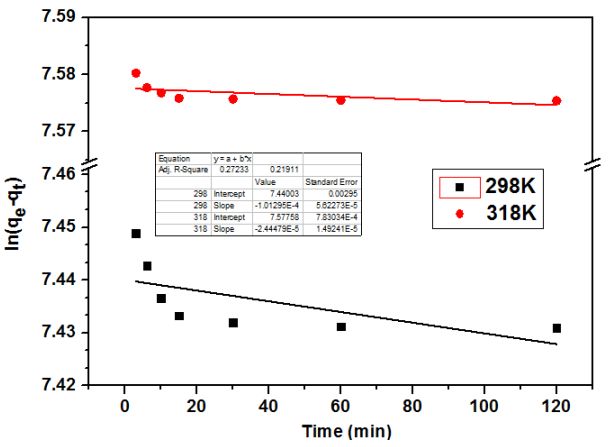


Fig. S4. Pseudo-first-order kinetics for removal of uranium by MCSH.

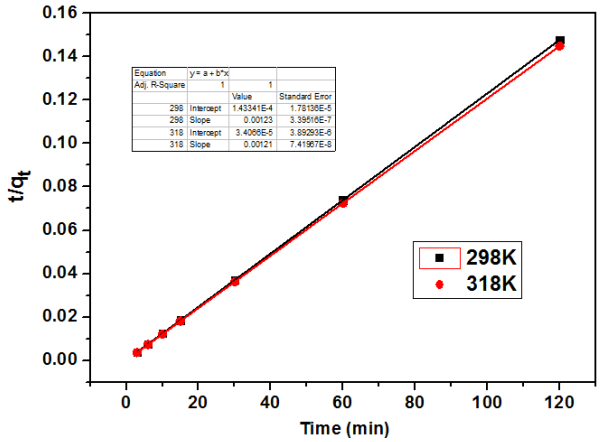
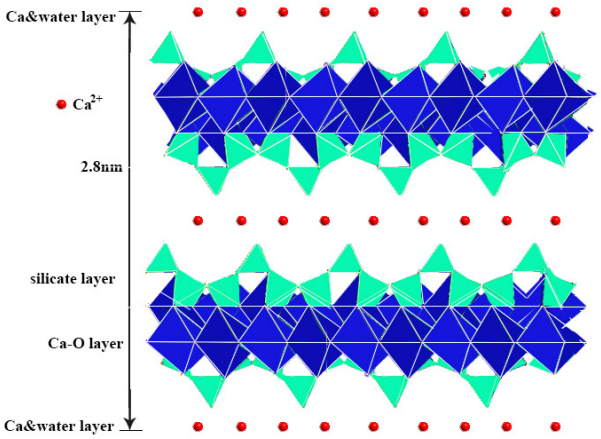


Fig. S5. Pseudo-second-order kinetics for removal of uranium by MCSH.

3 The structure of single unit cell of tobermorite

The structure of single unit cell of 1.4 nm tobermorite[1-3] is illustrated in Scheme S1. The double central layer of CaO octahedra is sandwiched between the silicate chains in the tobermorite-like CSH, and the parallel layered structure contains Ca^{2+} ions and water molecules, and water molecules are not shown.



Scheme S1. the layered crystal structure of 1.4 nm tobermorite

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