

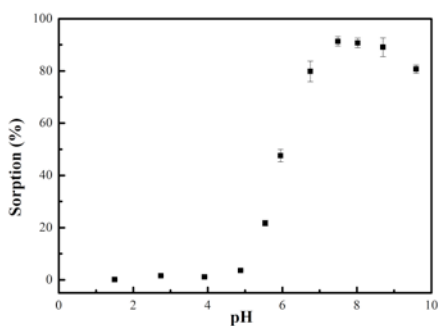
## The adsorption behavior of uranium on pyrophyllite

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### Experiments

Pyrophyllite is a kind of clay which is widely distributed in China. Previous researches also proved pyrophyllite has adsorption ability to metal ions[1]. In our work, we performed batch experiments to study uranium sorption behavior on pyrophyllite in different conditions, such as pH, temperature. The adsorption results at different pH is shown in Figure 1.



**Figure 1:** Sorption behavior of uranium on pyrophyllite at different pH. Solid-liquid ratio: 5g/L; initial uranium concentration:  $C_0=3.37\times 10^{-4}$  mol/L; temperature:  $T=25\pm 1^\circ\text{C}$ .

### Results and discussion

Compare experimental results with calculated results performed by our self-developed CHEMSPEC software[2]. We can see, when  $\text{pH}<4$ , the mainly species of uranium is  $\text{UO}_2^{2+}$ , and because of competitive effects of  $\text{H}^+$ , it has low adsorption quantity. At  $\text{pH } 5\sim 8$ , with the decrease of  $\text{H}^+$ , oligomer and precipitate appear, sorption ability is enhanced. At  $\text{pH}>8$ , uranium species is negatively charged, the sorption amount declines slightly[3].

[1] Prasad & Saxena (2008) *J Environ Manage* **88**, 1273-1279. [2] Zhu J B et al. (2012) *Sci China-Chem* **42**, 856-864. [3] Wazne M et al. (2003) *EST* **37**, 3619-3624.