Supporting Information

Reduction and adsorption capacities of soils for Cr(VI) and quantitative contributions of key influencing factors

Ze Zhang [a], Libing Zheng [a], Xinru Zhai [a], Shi–Wei Li [a], Helian Li [a,*]

[a] School of Water Conservancy and Environment, University of Jinan, Jinan 250022, China

* Corresponding author E-mail: chm_lihl@ujn.edu.cn (Helian Li)

Table S1 Summary of existing studies on Cr(VI) sorption in soils

Soil Type	Soil pH	Reaction conditions (time, temperature, soil/water ratio)	Initial Cr(VI) concentration (mg/L)	Analysis Type of sorption capacity	Sorption capacity (mg/kg)	Conclusion
Soils from 35 DoD facilities across the continental U.S. (Jardine et al. 2013)	3.15-9.01	3 replicate of 48 h; 25±1℃; 1:10	250	Saturated	50-750	Cr(VI) sorption increased with increasing soil TOC and decreasing pH.
Paddy soil (Li et al. 2012)	5.26-5.57	24 h; 25±1℃; 1:10	0–100	Equilibrium	0-300	Cr(VI) adsorption increased with increasing initial Cr(VI) concentration.
SOM-removed soil samples (Gu et al. 2017a)	3.0 - 10.0	48 h, 25℃, 1:200	0.538 – 27.2	Equilibrium	0-1414	Cr(VI) retention was strongly dependent on the pH of the reaction solution and Fe oxide content.
Soil from 7 different regions of China (Liu et al. 2021)	6.89-8.21	12 h, /, 1:10	5-400	Equilibrium	/	Fe_D was the most crucial factorinfluencing Cr(VI) adsorption, while soil texture controlled its transport; OM and Al_{OX} were secondary factors.
Cinnamon soil, fluvo-aquic soil, and loess soil. (Liu et al. 2019)	8.26-8.50	24 h; 25℃; 1:25	160	Equilibrium	180-220	Cr(VI) adsorption equilibrium time and capacity varied with soil type and soil layer.

References

1. P. M. Jardine, M. A. Stewart, M. O. Barnett, N. T. Basta, S. C. Brooks, S. Fendorf and T. L. Mehlhorn, Influence of soil geochemical and physical properties on chromium(VI) sorption and bioaccessibility. environ. Sci. Technol 2013, **47** (19), 11241–11248.
2. X. Li, T. Liu, N. Zhang, G. Ren, F. Li and Y. Li, Effect of Cr(VI) on Fe(III) reduction in three paddy soils from the hani terrace field at high altitude. Appl. Clay Sci 2012, **64**, 53–60.
3. X. Gu, J. Xie, X. Wang and L. J. Evans, A simple model to predict chromate partitioning in selected soils from China. J. Hazard. Mater 2017, **322**, 421–429.
4. X. Liu, X. Chen, X. Zhang, H. Guo, C. Zhang, X. Zang and B. Li, Quantifying the influence of soil factors on the migration of Chromium (VI). Process. Saf. Environ. Prot 2021, **155**, 32–40.
5. X. Liu, B. Cheng, R. Zhao, X. Hua, S. Wang, Z. Wang and Z. Ren, Adsorption characteristics of Cr(VI) in three soil types. Chin. Agric. Sci. Bulletin 2019, **35** (6), 44–53. [in Chinese]