

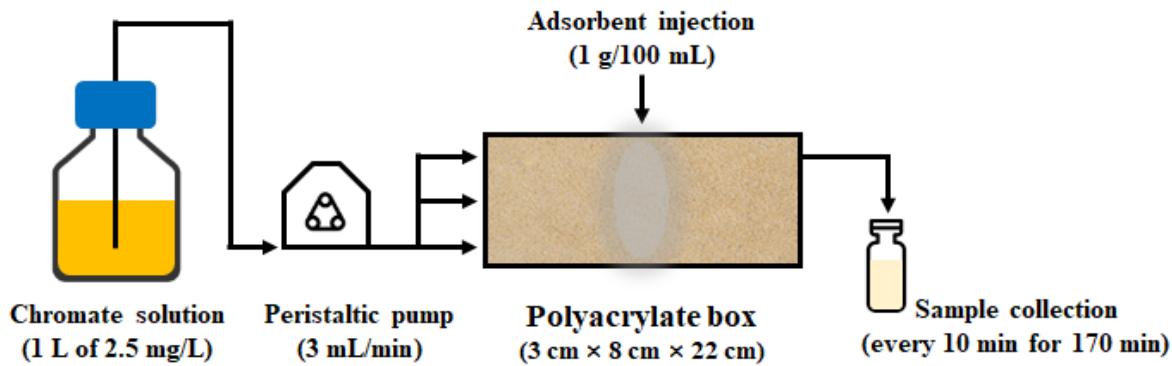
# Adsorption of Chromate Ions by Layered Double Hydroxide–Bentonite Nanocomposite for Groundwater Remediation

Yoogyeong Kim <sup>1</sup>, Yeongkyun Son <sup>1</sup>, Sungjun Bae <sup>2</sup>, Tae-Hyun Kim <sup>1,\*</sup> and Yuhoon Hwang <sup>1,\*</sup>

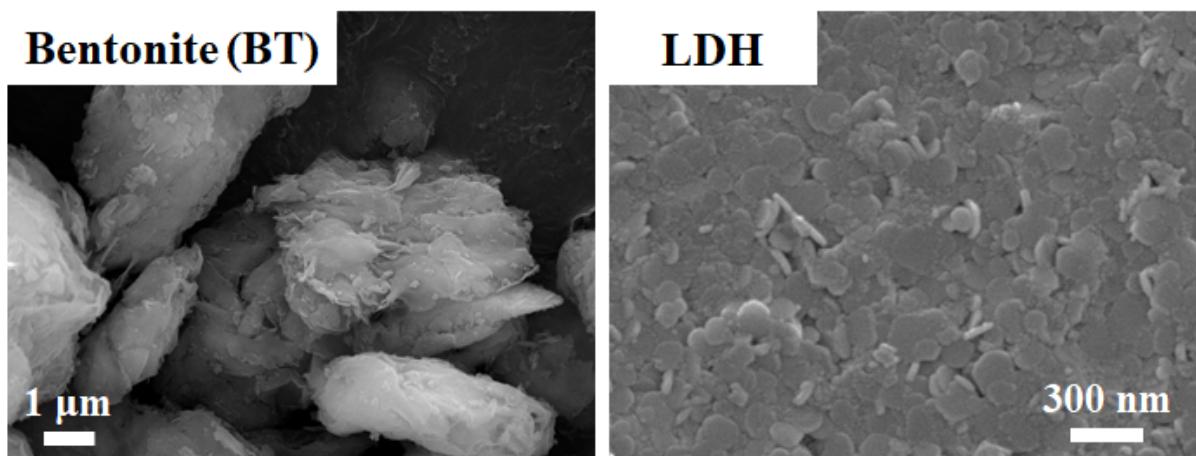
<sup>1</sup> Department of Environmental Engineering, Seoul National University of Science and Technology, Seoul 01811, Korea; keo0610@seoultech.ac.kr (Y.K.); clayton7167@naver.com (Y.S.)

<sup>2</sup> Department of Civil and Environmental Engineering, Konkuk University, Seoul 05029, Korea; bsj1003@konkuk.ac.kr

\* Correspondence: th.kim@seoultech.ac.kr (T.-H.K.); yhhwang@seoultech.ac.kr (Y.H.); Tel.: +82-2-970-6929 (T.-H.K.); +82-2-970-6626 (Y.H.); Fax: +82-2-971-5776 (T.-H.K. & Y.H.)



**Figure S1.** Schematic diagram of chromate adsorption in simulated sub-groundwater condition in box tester.



**Figure S2.** Scanning electron microscopy image of pristine bentonite and LDH.

**Table S1.** Chromate adsorption capacities of clay-based adsorbents.

Adsorbents	$Q_m^a$ (mg/g)	Chromate Concentration (mg/L)	Contact Time (min)	Dosing (g/L)	References
Akadama clay	4.29	50	180	5	[1]
OTMAC-Bentonite	12.40	40	60	6	[2]
Shanghai silty clay	1.85	10-250	1440	40	[3]
Natural clay	4.56	10-80	90	5	[4]
Kaolinite	0.571	0.1-16	1440	4	[5]
Illite	0.276	0.1-16	1440	4	[5]
MgAl-Cl (LDH)	58.82	5-200	120	2	[6]
LDH@BT_SP	6.705	2-100	120	1	This study

<sup>a</sup>Obtained from Langmuir isotherm fitting result.

## References

1. Zhao, Y.; Yang, S.; Ding, D.; Chen, J.; Yang, Y.; Lei, Z.; Feng, C.; Zhang, Z. Effective adsorption of Cr (VI) from aqueous solution using natural Akadama clay. *Journal of Colloid and Interface Science* **2013**, *395*, 198-204.
2. Zhang, S.; Yang, J.; Xin, X.; Yan, L.; Wei, Q.; Du, B. Adsorptive removal of Cr(VI) from aqueous solution onto different kinds of modified bentonites. *Environmental Progress & Sustainable Energy* **2015**, *34*, 39-46.

3. Wang, J.; Zhang, W. Evaluating the adsorption of Shanghai silty clay to Cd(II), Pb(II), As(V), and Cr(VI): kinetic, equilibrium, and thermodynamic studies. *Environmental Monitoring and Assessment* **2021**, *193*, 131.
4. Ashour, E.A.; Tony, M.A. Eco-friendly removal of hexavalent chromium from aqueous solution using natural clay mineral: activation and modification effects. *SN Applied Sciences* **2020**, *2*, 2042.
5. Ajouyed, O.; Hurel, C.; Marmier, N. Evaluation of the adsorption of hexavalent chromium on kaolinite and illite. *Journal of Environmental Protection* **2011**, *2*, 1347.
6. Khitous, M.; Salem, Z.; Halliche, D. Effect of interlayer anions on chromium removal using Mg-Al layered double hydroxides: Kinetic, equilibrium and thermodynamic studies. *Chinese Journal of Chemical Engineering* **2016**, *24*, 433-445.