

## Supporting Information

# “Fabrication of Nanometer-Sized Nickel-based Metal Organic Framework on Carbon Nanotubes for Electro-Catalytic Oxidation of Urea and Arsenic Removal”

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**Table S1.** Comparison of arsenic removal by MOF based adsorbents

<b>Sample Name</b>	<b>Type of MOF</b>	<b>Arsenic adsorption capacity (mg g<sup>-1</sup>)</b>	<b>Ref.</b>
Zn-MOF-74	Room temperature synthesized Zn-MOF	99	[1]
	High temperature synthesized Zn-MOF	48.7	[1]
UiO-66	Zr-MOF	200	[2]
UiO-66	Zr-MOF	303	[3]
Fe decorated UiO-66	Fe/Zr-MOF	360.6	[4]
UiO-66-NH <sub>2</sub>	Zr-MOF	284	[5]
AUBM-1	In-MOF	103.1	[6]
UiO-66	Zr-MOF	132.5	[7]
MIL-88A	Fe based MIL-88A	145	[8]
MIL-100	Fe based MIL-100	35.2	[9]
MOF-74	Fe-Co based MOF-74	147.82	[10]
MOF-74	Zn-MOF 74	325	[11]
Ni-MOF	Ni-MOF on CNT	173.3	This work

## References

1. Abu Tarboush, B. J.; Chouman, A.; Jonderian, A.; Ahmad, M.; Hmadeh, M.; Al-Ghoul, M. Metal–Organic Framework-74 for Ultratrace Arsenic Removal from Water: Experimental and Density Functional Theory Studies. *ACS Appl. Nano Mater.* 2018, 1, 3283– 3292.
2. Assaad, N.; Sabeh, G.; Hmadeh, M. Defect Control in Zr-Based Metal-Organic Framework Nanoparticles for Arsenic Removal from Water. *ACS Appl. Nano Mater.* 2020, 3, 8997– 9008.
3. Wang, C.; Liu, X.; Chen, J.; Li, K. Superior removal of arsenic from water with zirconium metal-organic framework UiO-66. *Sci Rep.*, 2015, 5, 16613.
4. Liu, T.; Zhang, Z.; Wang, Z.; Wang, Z.-L.; Bush, R. Highly efficient and rapid removal of arsenic (iii) from aqueous solutions by nanoscale zero-valent iron supported on a zirconium 1, 4-dicarboxybenzene metal–organic framework (uio-66 mof). *RSC Adv.* 2019, 9, 39475–39487.
5. Somjit, V.; Thinsoongnoen, P.; Sriphumrat, K.; Pimu, S.; Arayachukiat, S.; Kongpatpanich, K. Metal–Organic Framework Aerogel for Full pH Range Operation and Trace Adsorption of Arsenic in Water. *ACS Appl. Mater. Interfaces* 2022, 14, 35, 40005–40013.
6. Atallah, H.; ELcheikh Mahmoud, M.; Jelle, A.; Lough, A.; Hmadeh, M. A highly stable indium based metal organic framework for efficient arsenic removal from water. *Dalton Trans.* 2018, 47, 799– 806
7. Jrad, A.; Damacet, P.; Yaghi, Z.; Ahmad, M.; Hmadeh, M. Zr-Based Metal–Organic Framework Nanocrystals for Water Remediation. *ACS Appl. Nano Mater.* 2022, 5, 8, 10795– 10808.
8. Wu, H.; Ma, M-D.; Gai, W-Z.; Yang, H.; Zhou, J-G.; Cheng, Z.; et al. Arsenic removal from water by metal-organic framework MIL-88A microrods. *Environ. Sci. Pollut. Res.* 2018, 25,

27196–27202.

9. Wang, D.; Gilliland, S. E., III; Yi, X.; Logan, K.; Heitger, D. R.; Lucas, H. R.; Wang, W.-N. Iron mesh-based metal organic framework filter for efficient arsenic removal. *Environ. Sci. Technol.* 2018, 52, 4275–4284.

10. Sun, J.; Zhang, X.; Zhang, A.; Liao, C. Preparation of Fe–Co based MOF-74 and its effective adsorption of arsenic from aqueous solution. *J Environ Sci (China)*.

11. Yu, W.; Luo, M.; Yang, Y.; Wu, H.; Huang, W.; Zeng, K.; Luo F. Metal-organic framework (MOF) showing both ultrahigh As(V) and As(III) removal from aqueous solution. *J Solid State Chem.* 2019, 269, 264-270.

12. This work.