# Supporting Information

## Layered Aluminum-based Metal-Organic Framework as a Superior Trap for Nitrobenzene Capture *via* an Intercalation Role

Qi Zhang [a,b,1], Meipeng Jian [c,1], Pin Zhao [d], Chengzhi Hu [a,e]*, Jiuhui Qu [a,d,e], Xiuyu Li [f], Jiukun Hu [f], Ruiping Liu [a,e], Xiwang Zhang [c]*

[a] State Key Laboratory of Environmental Aquatic Chemistry, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, 100085, China

[b] School of Environment, Northeast Normal University, Changchun 1l30117, Jilin, China

[c] Department of Chemical Engineering, Monash University, Clayton, VIC 3800, Australia

[d] Center for Water and Ecology, State Key Joint Laboratory of Environment Simulation and Pollution Control, School of Environment, Tsinghua University, Beijing 100084, China

[e] University of Chinese Academy of Sciences, Beijing 100049, China

[f] Jiangsu Easthigh Environmental Holdings Co. Ltd., Zhenjiang 212431,China

[1] These authors contributed equally to this work.

*Correspondence to Emails:

Prof. Chengzhi Hu
E-mail: czhu@rcees.ac.cn

Prof. Xiwang Zhang
E-mail: Xiwang.Zhang@monash.edu

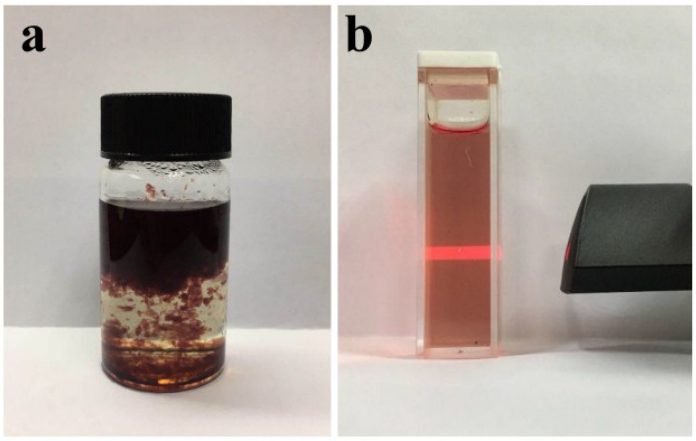


**Fig. S1** (a) Digital photos of as-synthesized Al-TCPP suspension. (b) Tyndall effect of colloidal layered Al-TCPP suspension in DMF after sonication.

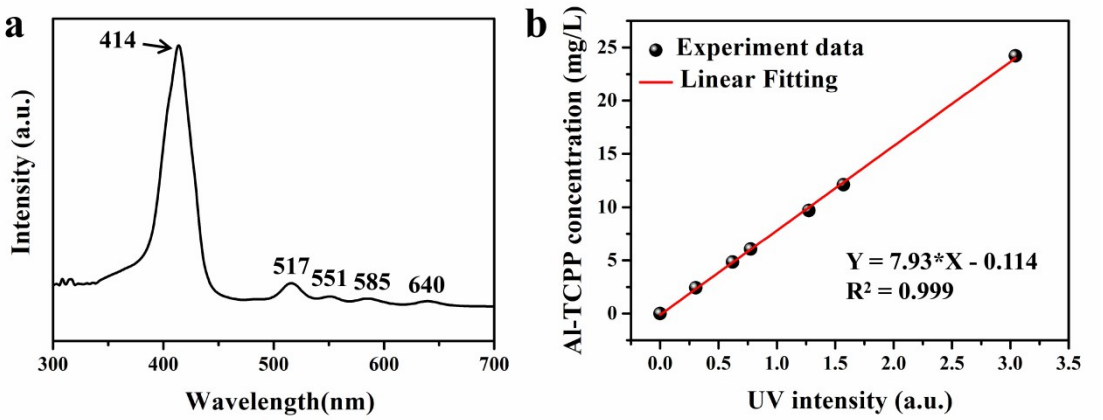


**Fig. S2** (a) The wavelength scanning and (b) the standard curve of layered Al-TCPP dispersion by UV-Vis.

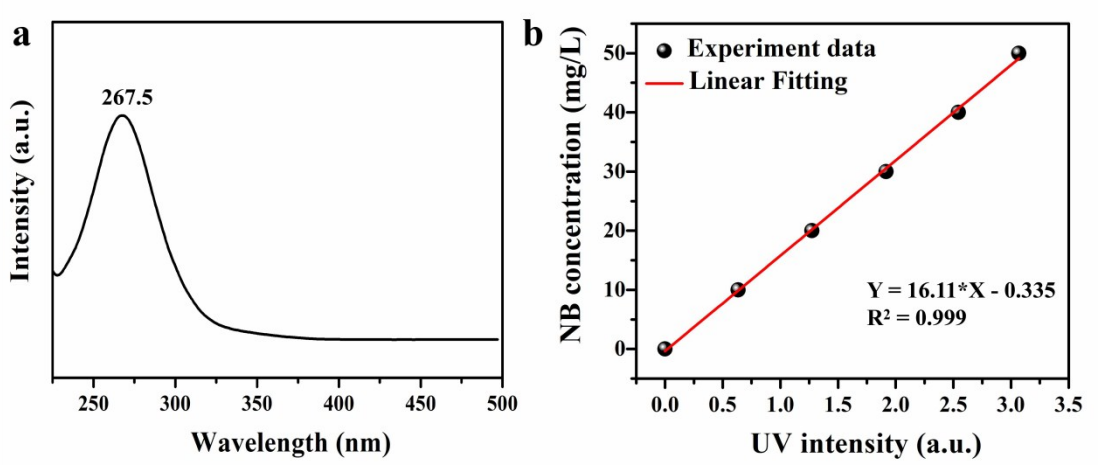


**Fig. S3** (a) The wavelength scanning and (b) the standard curve of NB aqueous by UV-Vis.

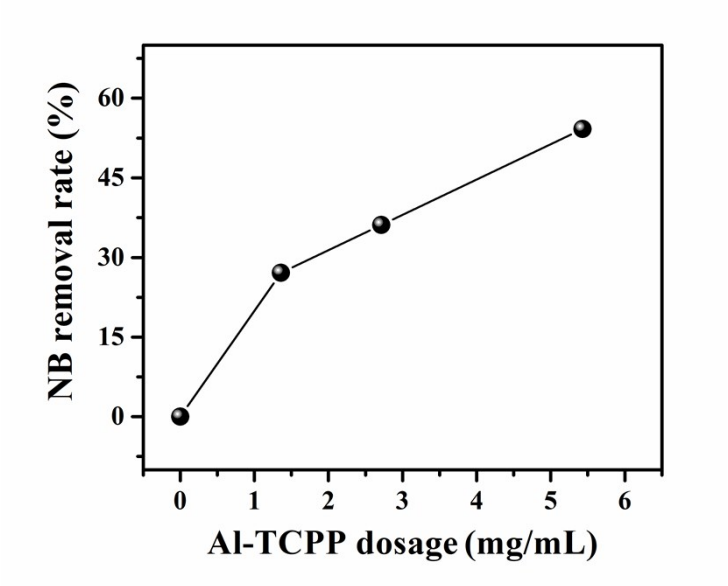


**Fig. S4** Effect of layered Al-TCPP dosage on the removal rate of NB.

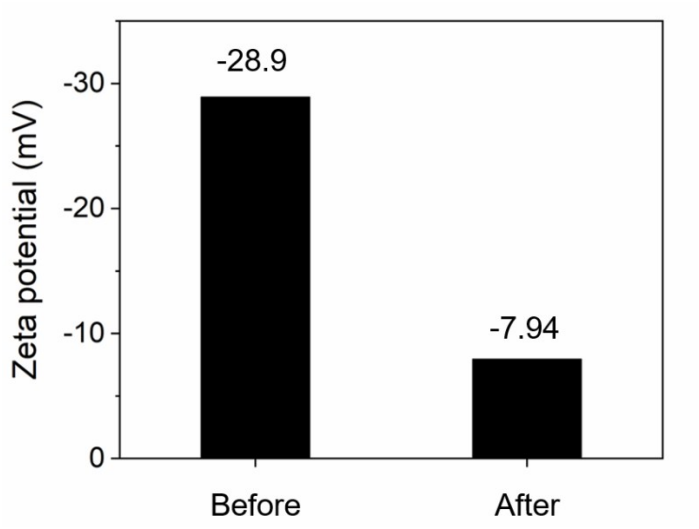


**Fig. S5** Zeta potential of layered Al-TCPP before and after NB adsorption at pH = ~6.0.

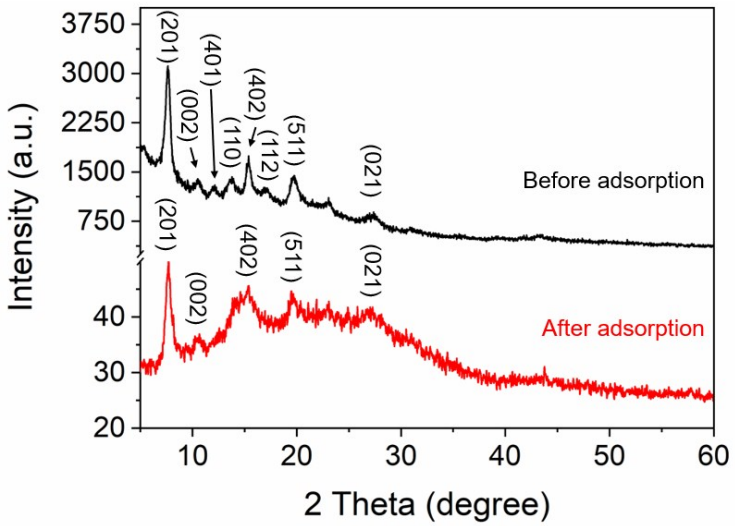


**Fig. S6** XRD patterns comparison of layered Al-TCPP before and after adsorption from the whole scale.

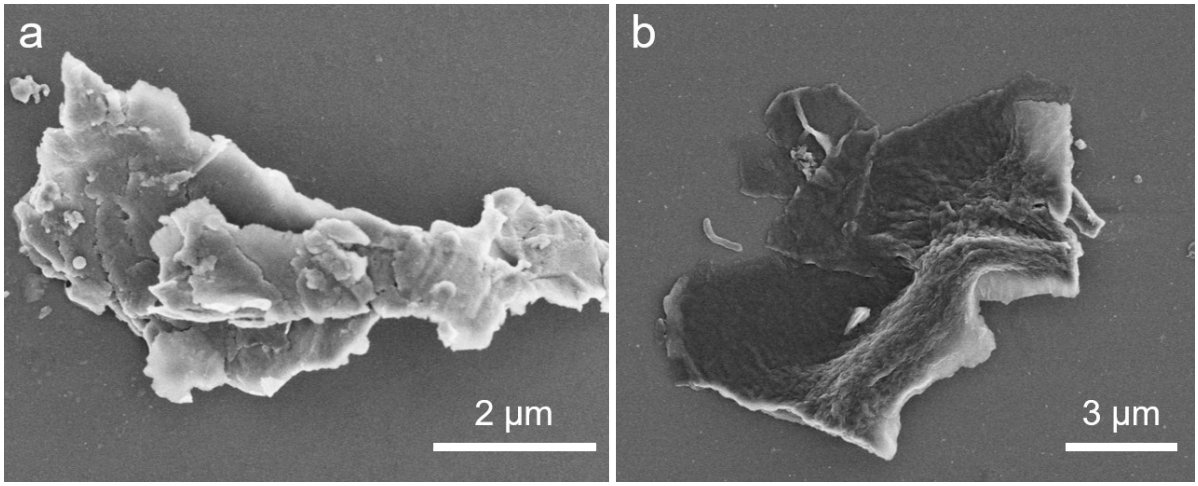


**Fig. S7** SEM images of layered Al-TCPP after NB adsorption with different initial concentrations. (a) $C_0$ = 200 mg/L, (b) $C_0$ = 1500 mg/L.

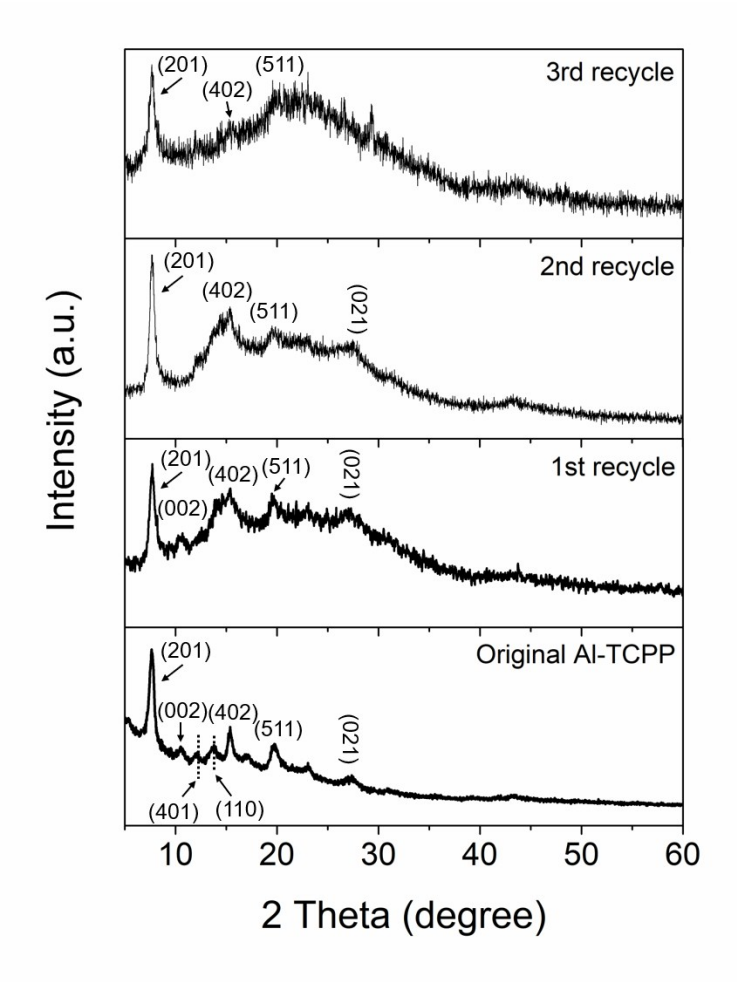


**Fig. S8** XRD patterns of layered Al-TCPP after different regeneration recycles.

**Table S1.** Parameters of adsorption isotherms for NB adsorption on layered Al-TCPP.

| Model | Parameter | | |
|---|---|---|---|
| Langmuir | $Q_0$ | $K_L$ | $R^2$ |
| | 1846.7 | 9.42E-4 | 0.950 |

**Table S2.** Comparison of the NB adsorption performance with other adsorbents.

| Material | Adsorption saturation time/min | Maximum adsorption capacity/mg g-1 | Ref. |
|---|---|---|---|
| Layered Al-TCPP | 1 | 1846.7 | This work |
| Modified MCM-41(Al-C) | 1 | 243.9 | 1 |
| Modified MCM-41($CH_3$-MCM-41) | 1 | 46.1 | 2 |
| Nanocrystalline hydroxyapatite(HAP) | 1 | 5.754 | 3 |
| MCM-41(Si-C) | 1 | 0.263 | 4 |
| Rice husk (RHC) | 5 | 446 | 5 |
| Carbon materials(from the combustion of woody biomass) | 5 | 294 | 6 |
| Cotton fibers | 5 | 17.91 | 7 |
| Reduced graphene oxide (RGO) | 12 | 260.945 ± 8.861 | 8 |
| MIL-53(Al) | 20 | 610 | 9 |
| $CH_3O$-SBA-15 | 20 | 1.28 | 10 |
| Silica aerogel | 45 | 7.29 | 11 |
| MIL-68(Al) | 60 | 1130 ± 10 | 12 |
| CAU-1 | 60 | 970 ± 10 | 12 |
| Furnace ash | 90 | 0.232 | 13 |
| Activated carbon $_{NO-T}$ | 120 | 1443.53 | 14 |
| Modified activated sludge | 120 | 25 | 15 |
| Oxidized activated carbon(OxOG-AC) | 300 | 393.952 | 16 |
| Organoclay(stearyldimethyl benzylam-monium chloride) | 300 | 290 | 17 |
| Organoclay | 300 | 100 | 18 |
| Activated carbon commercial (ACC) | 300 | 90 | 19 |
| Hypercrosslinked resin(CH-10) | 360 | 543.7±41.7 | 20 |
| Marine sediment | 360 | 1.635 | 21 |
| Magnetically separable porous carbon | 420 | 100 | 22 |
| Lipoid adsorption material (LAM) | 480 | 1.22 | 23 |
| MC(W-70A) | 1000 | 98.5 | 24 |
| MIL-101 | 1440 | 33 | 25 |
| Polystyrene(50 μm) | 2880 | 1.4 | 26 |
| Crop biological waste(biosorption) | 4320 | 1.5 | 27 |

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