

Supporting Information

**Efficient removal of thallium from flue gas using manganese-based MOF
catalysts by gas–solid phase catalytic oxidation and adsorption**

Qiang Ma ^{a, c}, Lijuan Jia ^{b, *}, Xueqian Wang ^{a, *}, Ping Ning ^a, Langlang Wang ^a, Lixia
Xu ^a, Shu Sun ^c, Yixing Ma ^a, Yingjie Zhang ^a, Tao Lei ^a, Wei Liu ^a, Jiming Hao ^d

^a Faculty of Environmental Science and Engineering, Kunming University of
Science and Technology, Kunming 650500, Yunnan, China

^b School of Chemistry and Environment, Yunnan Minzu University, Kunming
650500, Yunnan, China

^c Sichuan Academy of Environmental Science, Chengdu 610041, Sichuan, China

^d State Key Joint Laboratory of Environment Simulation and Pollution Control,
School of Environment, Tsinghua University, Beijing 100084, China

Table S1 Comparison of the Tl(I) removed amount on Mn-loaded MOF with reported
studies.

1 **Table S2** Comparison of the Tl(I) removed amount on Mn-loaded MOF with reported studies.

environmental medium	mechanism	catalyst/sorbent	particle size (μm)	removal rate (%)	reaction time (min)	temperature (K)	removed amount (mg/g)	regeneration cycles	reference in manuscript
waste water	adsorption and oxidation	manganese dioxide coated magnetic pyrite cinder	0.39	99	700	298	320	5	10
aqueous solutions	adsorption and oxidation	amorphous hydrous manganese dioxide	-	88	120	288, 303, and 318	79.05	5	11
water	adsorption	titanium peroxide	110	95	720	298	412	5	8
Water	adsorption	mesoporous silica	-	95	1000	298	28.3	-	13
aqueous solution	adsorption	treated sawdust	600	98	8	293-313	13.2	1	14
aqueous solution	adsorption	sugar beet pulp	250	96	15	298	185.2	-	15
aquatic environment	adsorption	multiwalled carbon nanotubes	-	95	400	298	0.43	-	16
aqueous solutions	adsorption	titanate nanotubes		100	180	298	709.2	2	17
aqueous solutions	biochemistry	aspergillus niger biomass	-	70	700	295	10	-	18

water	adsorption and oxidation	nanosized manganese dioxide	-	83	1440	298	672	-	12
smelting flue gas	adsorption and oxidation	manganese loaded MOF	0.083	90	600	423	89.54	5	this study

1
2