

**Surface functionalization of MIL-101(Cr) by aminated mesoporous silica  
and improved adsorption selectivity toward special metal ions**

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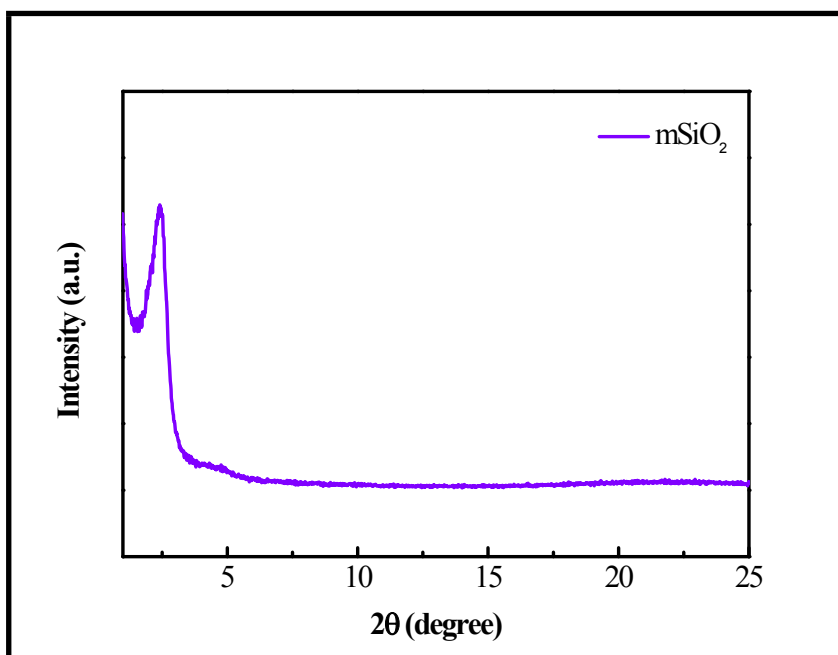


Fig. S1 XRD pattern of mesoporous SiO<sub>2</sub>.

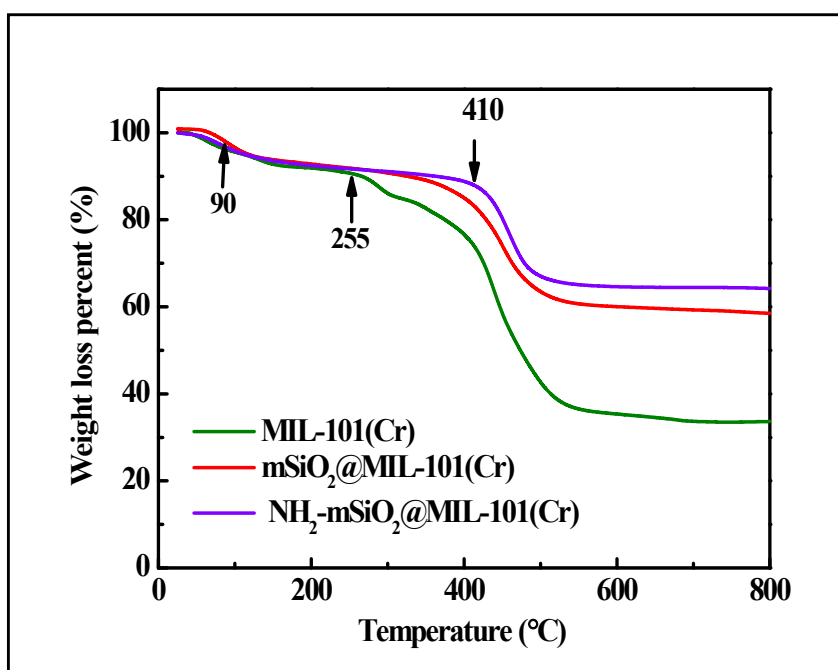


Fig. S2 TG curves of MIL-101(Cr) , mSiO<sub>2</sub>@MIL-101(Cr) and NH<sub>2</sub>-mSiO<sub>2</sub>@MIL-101(Cr) .

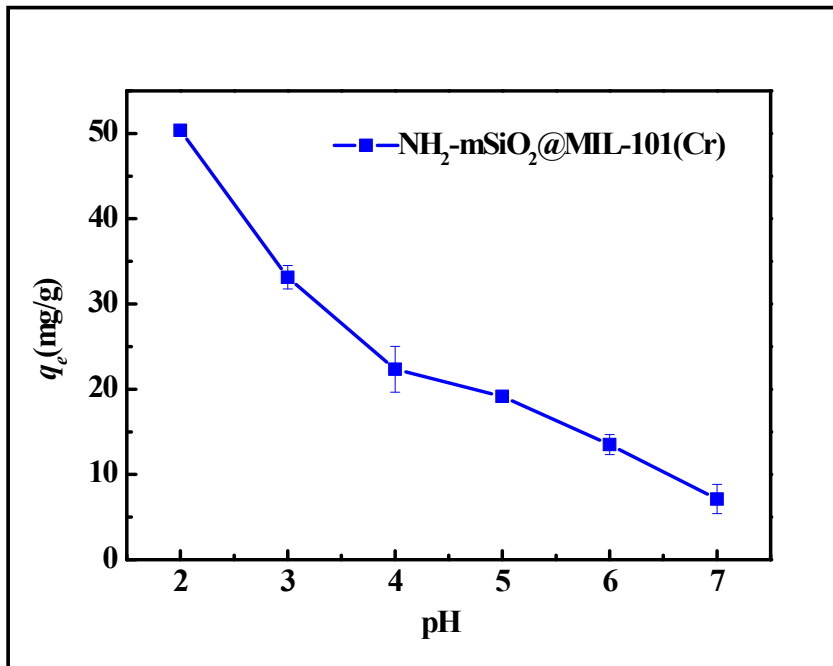


Fig. S3 Effect of pH conditions on the adsorption of Cr(VI) on NH<sub>2</sub>-mSiO<sub>2</sub>@MIL-101(Cr)

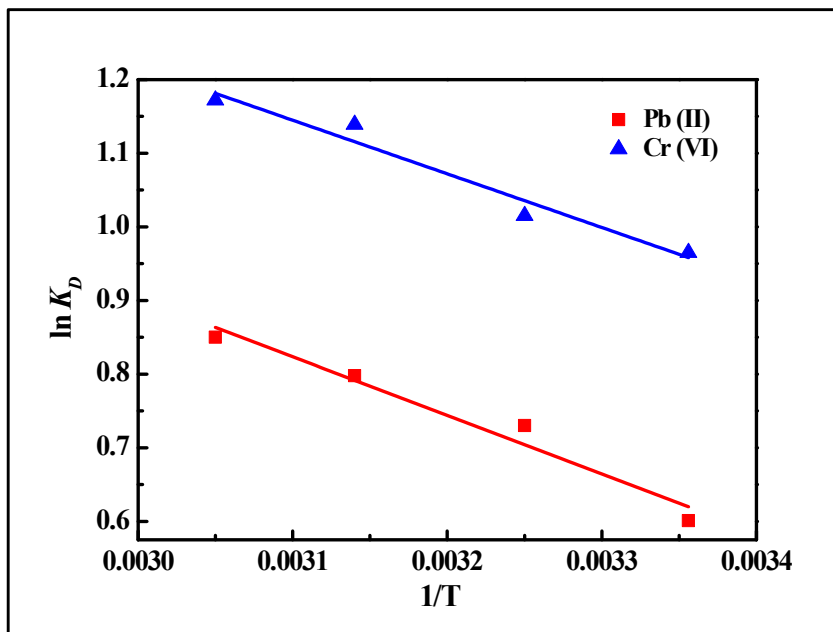


Fig. S4 Plots curves of  $\ln K_D$  versus  $1/T$  based on the adsorption data of Pb(II) and Cr(VI) on NH<sub>2</sub>-mSiO<sub>2</sub>@MIL-101(Cr) at different temperature.

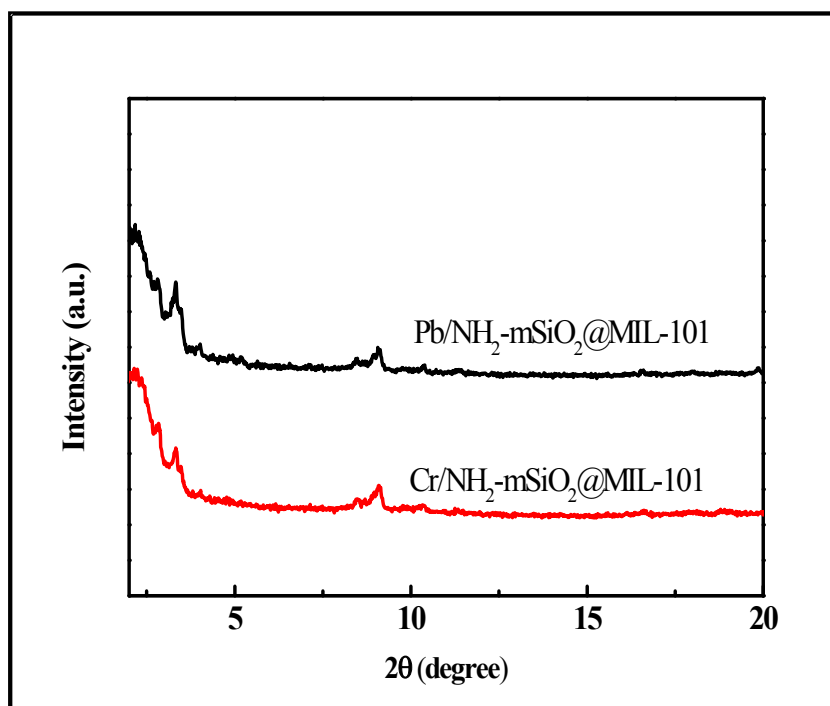


Fig. S5 XRD patterns of NH<sub>2</sub>-mSiO<sub>2</sub>@MIL-101 after the adsorption of Pb(II) and Cr(VI).

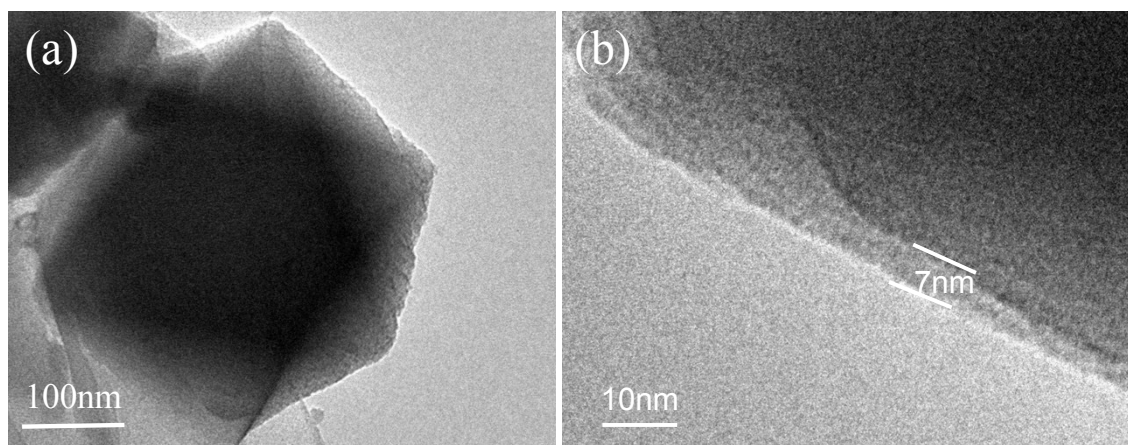


Fig. S6 TEM images of NH<sub>2</sub>-mSiO<sub>2</sub>@MIL-101(Cr) after the adsorption of Pb(II) under different magnification.

Table S1 The calculated BET surface area, pore volume and pore size of original MIL-101(Cr) and functionalized MIL-101(Cr)

Samples	BET surface area ( $\text{m}^2 \text{g}^{-1}$ )	Pore volume ( $\text{cm}^3 \text{g}^{-1}$ )	$d_p$ (nm)
MIL-101	3564.4	2.4	1.21
mSiO <sub>2</sub> @MIL-101	1046.6	0.74	1.21
NH <sub>2</sub> -mSiO <sub>2</sub> @MIL-101	928.2	0.63	1.21