Supporting Information

Enhanced Adsorption Performance of Aspartic Acid Intercalated Mg-Zn-Fe-LDHs Material for Arsenite

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Supporting Information:

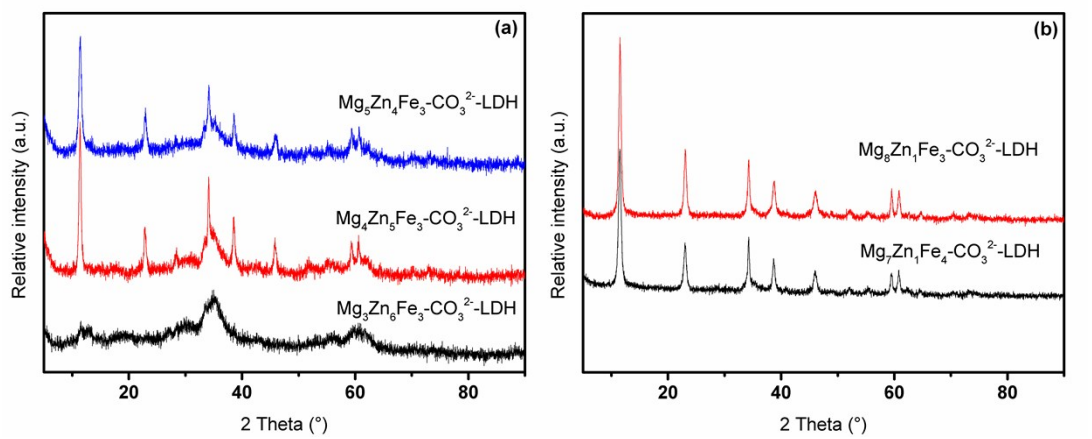

Fig.S1 XRD patterns of carbonate intercalated LDHs with different metal ratios

Table S1 The data sheet of specific surface analysis

Materials	BET surface area ($m^2 \cdot g^{-1}$)	C-value in BET equation	Pore volume ($cm^3 \cdot g^{-1}$)	Average Pore Diameters (nm)	particle Diameters (nm)	practical surface area ($m^2 \cdot g^{-1}$)
$Mg_7Zn_1Fe_4$-Asp-LDH	157.2	220.1	0.1406	3.713	10	300
$Mg_7Zn_1Fe_4$-Phe-LDH	92.28	152.2	0.1414	3.934	9	333

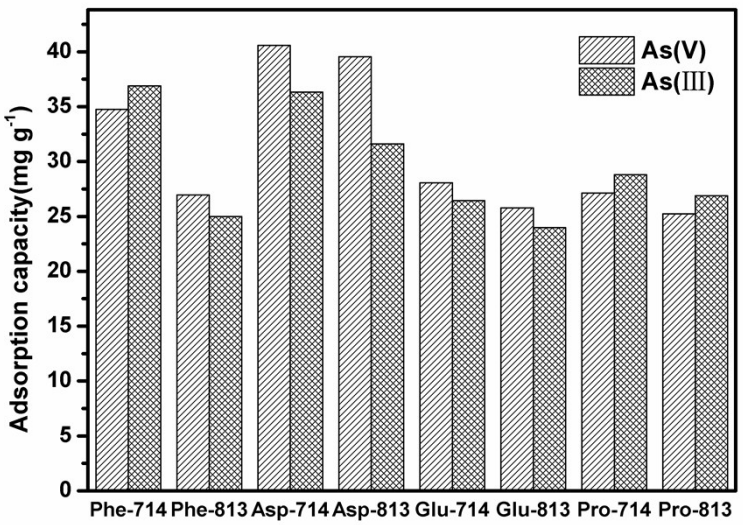

Fig.S2 The preminary screening of obtained LDHs materials for the adsorption performance of arsenic species

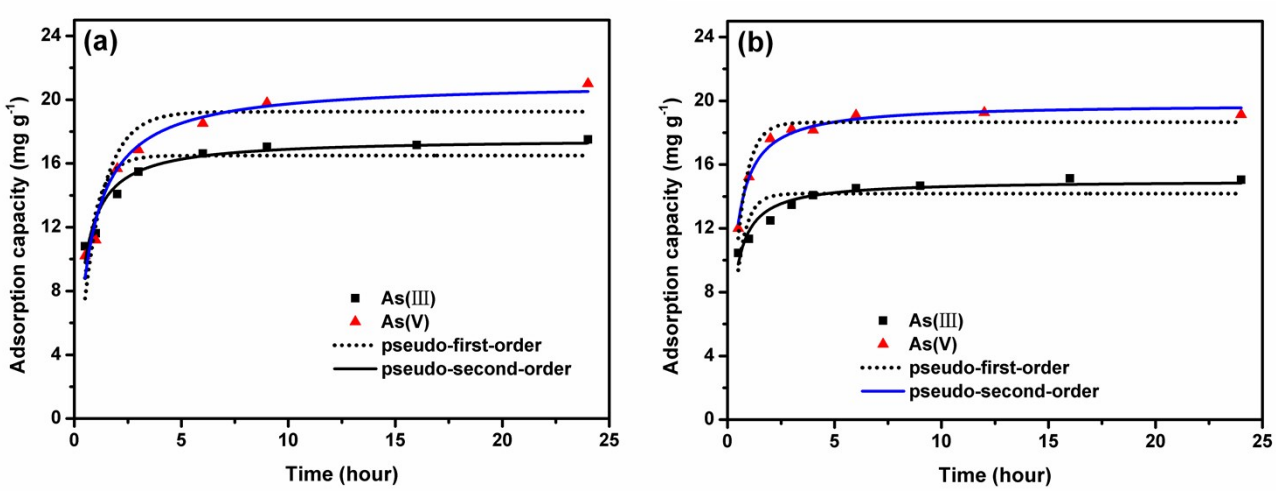

Fig.S3 (a)Adsorption kinetics of arsenic on $Mg_7Zn_1Fe_4$-Asp-LDH, (b) Adsorption kinetics of arsenic on $Mg_7Zn_1Fe_4$-Phe-LDH

Table S2 Adsorption kinetic model fitting parameters

		Pseudo-first-order			Pseudo-second-order		
		q_e(mg·g^{-1})	k_1(min^{-1})	R^2	q_e(mg·g^{-1})	k_2(g·(mg·min)$^{-1}$)	R^2
$Mg_7Zn_1Fe_4$-Asp-LDH	As(III)	16.5	1.5298	0.737 0	17.6	0.1432	0.9420
	As(V)	19.2	0.9928	0.829 6	21.1	0.06782	0.9540
$Mg_7Zn_1Fe_4$-Phe-LDH	As(III)	14.2	2.1663	0.629 3	15.0	0.2472	0.9215
	As(V)	18.6	1.8834	0.940 7	19.8	0.1652	0.9834

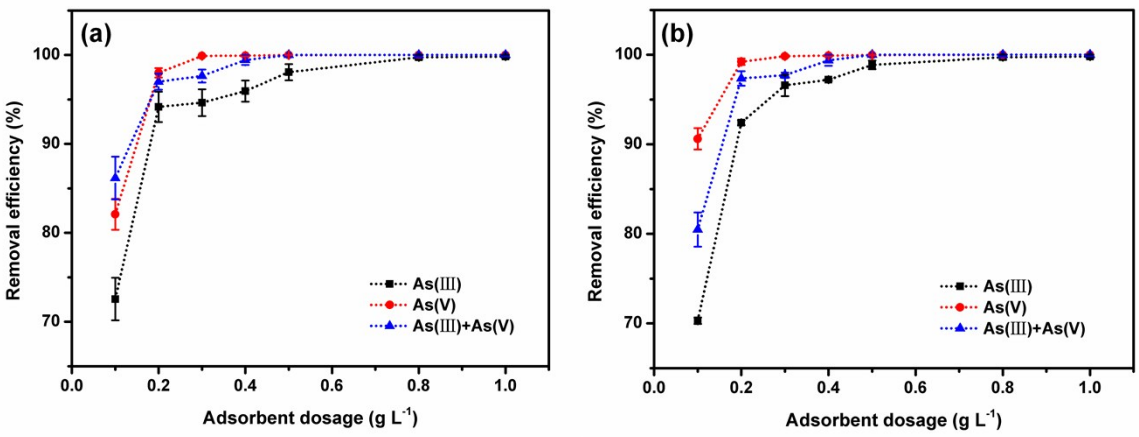

Fig.S4 (a) Effect of $Mg_7Zn_1Fe_4$-Asp-LDH dosage on arsenic adsorption, (b) Effect of $Mg_7Zn_1Fe_4$-Phe-LDH dosage on arsenic adsorption

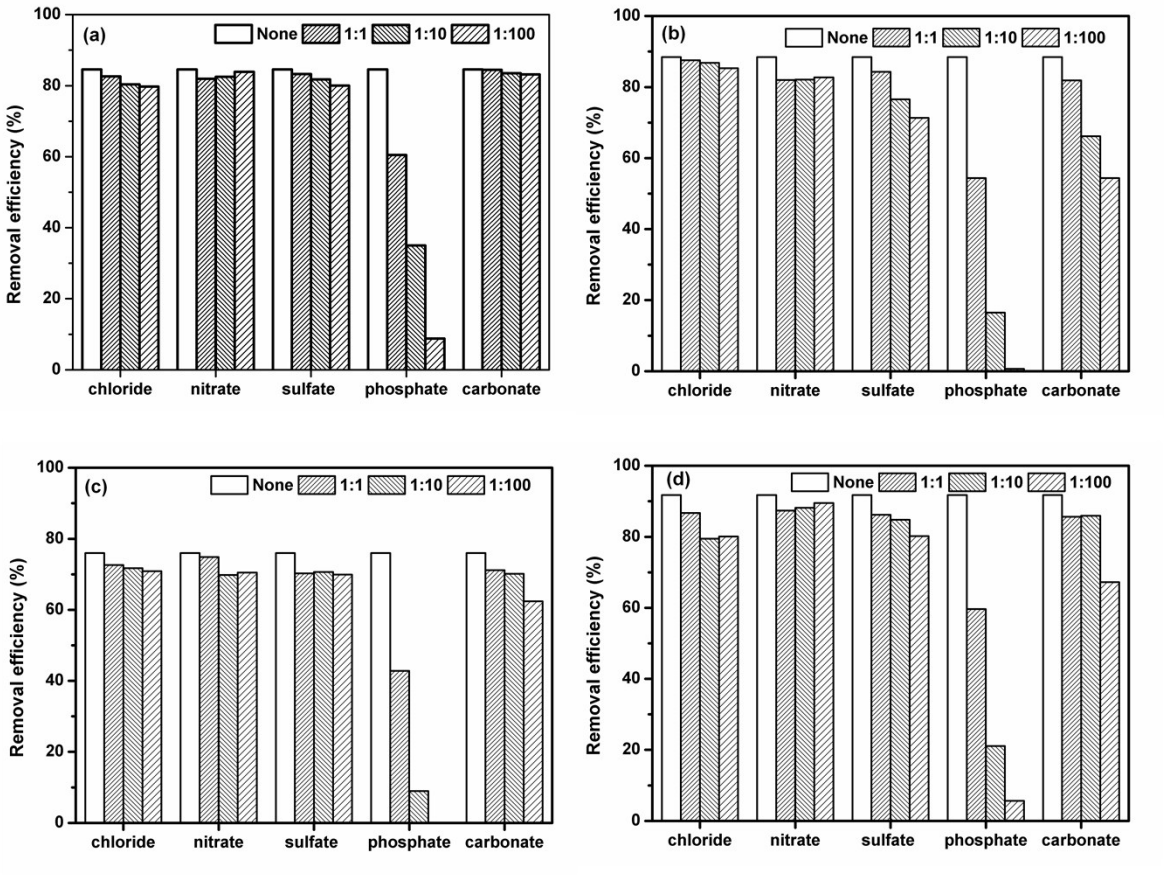

Fig.S5 (a) Effect of anions for As(III) adsorption on $Mg_7Zn_1Fe_4$-Asp-LDH, (b) Effect of anions for As(V) adsorption on $Mg_7Zn_1Fe_4$-Asp-LDH, (c) Effect of anions for As(III) adsorption on $Mg_7Zn_1Fe_4$-Phe-LDH, (b) Effect of anions for As(V) adsorption on $Mg_7Zn_1Fe_4$-Phe-LDH

Table S3 Desorption rate of materials after adsorption arsenic

	Desorption rate (%)			
	Asp-LDH-As(III)	Asp-LDH-As(V)	Phe-LDH-As(III)	Phe-LDH-As(V)
NaOH	41.10	27.27	50.82	47.02
Na_2CO_3	24.02	31.92	33.13	34.72
Na_2HPO_4	23.30	38.42	34.84	52.36

Table S4 Analysis results of practical water sample（mg·L^{-1}）

	As	B	Ba	Mg	Fe	Ca	Cd	K	Cr	Cu
1	0.03	0.01	0.03	9.24	0.54	6.89	0	1.9	0	0.01
2	1.11	0.07	0.04	7.69	0	6.64	0	9.8	0	0.01
3	0.02	0.03	0.05	14.4	1.58	6.19	0	3.44	0	0.01
	Na	Al	P	Pb	Se	Sr	V	Zn	Sb	Li
1	10.62	0.47	0	0	0	0.31	0	0	0.18	0.01
2	36.09	0.21	0.02	0	0	0.45	0	0.07	0.1	0.09
3	13.91	1.3	0	0	0	0.54	0	0	0.67	0.03

Table S5 Surface Element Composition of materials after adsorption of arsenic

Elements (At%)	C	O	Mg	Fe	Zn	As	Total
$Mg_7Zn_1Fe_4$-Asp-LDH-As(V)	15.95	67.3	9.61	6.46	0.58	0.1	100
$Mg_7Zn_1Fe_4$-Asp-LDH-As(III)	20.39	62.18	8.78	7.8	0.63	0.22	100
$Mg_7Zn_1Fe_4$-Phe-LDH-As(V)	18.57	64.44	9.79	5.58	1.59	0.04	100
$Mg_7Zn_1Fe_4$-Phe-LDH-As(III)	16.81	65.14	9.84	6.09	1.91	0.21	100

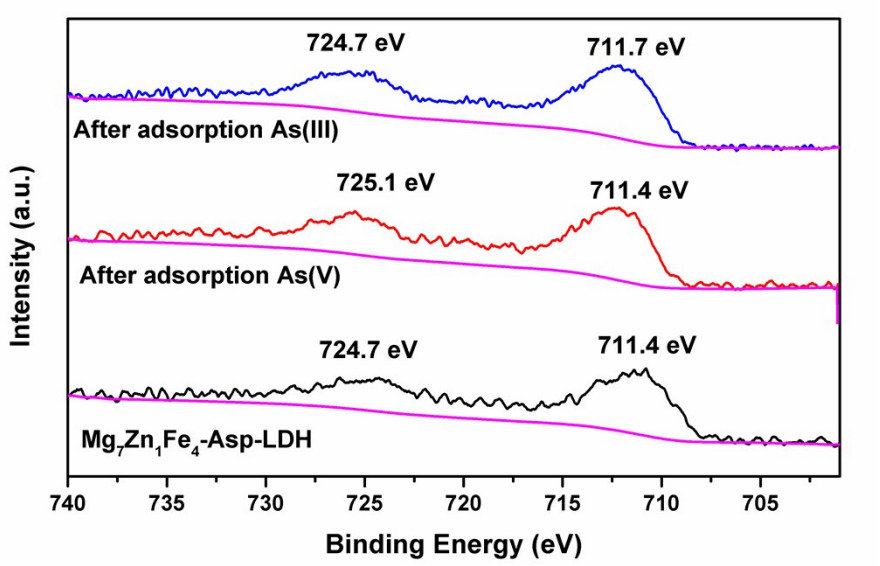

Fig.S6 XPS spectra (Fe2p scan) of $Mg_7Zn_1Fe_4$-Asp-LDH before and after adsorption of arsenic.