

Supporting information for “Sulfur-doped Fe-Cu-La trimetallic
oxides as a novel magnetic adsorbent for efficient removal of As(III) and
As(V) from aqueous solution”

Baoxia Liu¹, Haiyan Liu¹, Wei Li², Yuxin Li³, Yeqing Lan¹, Ying Li^{1*}

¹College of Sciences, Nanjing Agricultural University, Nanjing 210095, P.R. China.

²Technology Center, China Tobacco Jiangsu Industrial Co., Ltd., Nanjing 210019,
China.

³College of Resources and Environmental Sciences, Nanjing Agricultural University,
Nanjing 210095, P.R. China.

Text S1

All reagents were of analytical grade and used without further purification. $\text{LaCl}_3 \cdot 7\text{H}_2\text{O}$ was obtained from Shanghai Macklin Biochemical Co., Ltd (China). Thiourea (H_2NCSNH_2) as sulfur source was purchased from Xilong Chemical Co., Ltd (Guangdong, China). NaAsO_2 and $\text{Na}_2\text{HAsO}_4 \cdot 7\text{H}_2\text{O}$ were purchased from Sigma-Aldrich (USA). $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ and $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ were obtained from Sinopharm Chemical Reagent Co., Ltd. (China) and Chengdu Chron Chemicals Co., Ltd. (China), respectively. $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$ was supplied from Tianjin Kemiou Chemical Reagent Co., Ltd. Hydrazine hydrate ($\text{N}_2\text{H}_4 \cdot \text{H}_2\text{O}$) was obtained from Nanjing Chemical Reagent Co., Ltd. (China). Ammonia ($\text{NH}_3 \cdot \text{H}_2\text{O}$) and polyethylene Glycol (PEG) 6000 were bought from Guangdong Guanghua Technology Co. Ltd. (China). Humic acid (HA) ($\geq 90\%$), tertbutyl alcohol (TBA) and p-benzoquinone (BQ) were purchased from

Aladdin Inc. (Shanghai, China).

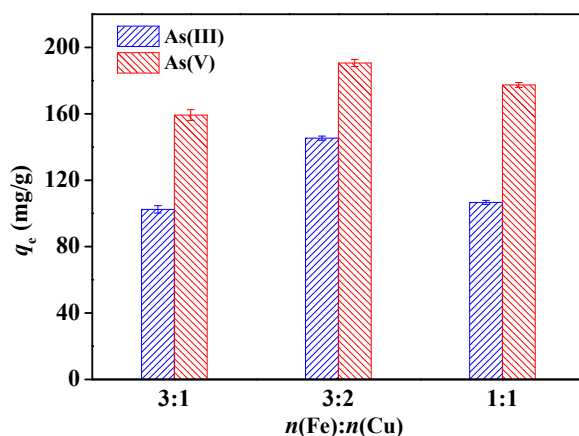


Fig. S1 Effect of different molar ratios of iron and copper on the adsorption of As(III) and As(V). Adsorbent dose = 0.2 g/L, $c(\text{As})_0 = 50$ mg/L, Initial solution pH = 6.0, $T = 25^\circ\text{C}$.

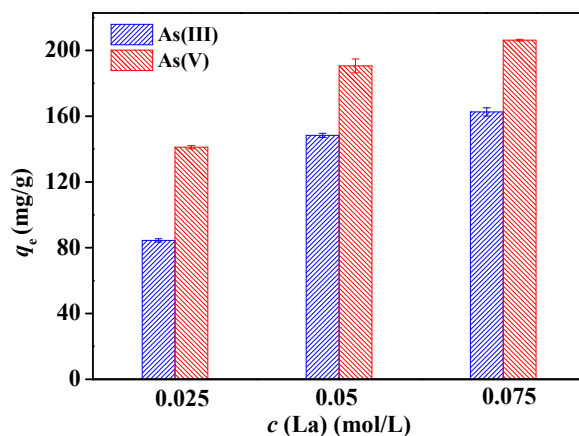


Fig. S2 Effect of lanthanum concentrations of on the adsorption of As(III) and As(V). Adsorbent dose = 0.2 g/L, $c(\text{As})_0 = 50$ mg/L, Initial solution pH = 6.0, $T = 25^\circ\text{C}$.

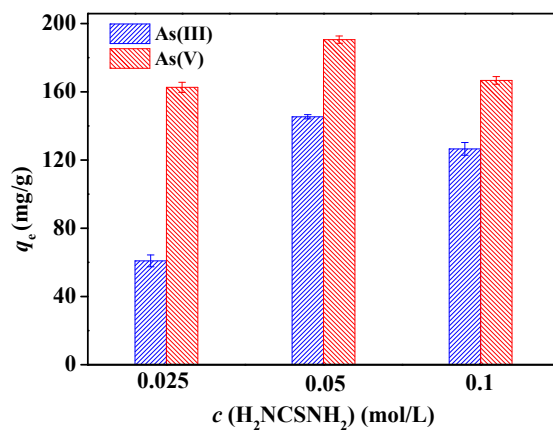


Fig. S3 Effect of thiourea concentrations on the adsorption of As(III) and As(V). Adsorbent dose = 0.2 g/L, $c(\text{As})_0 = 50$ mg/L, Initial solution pH = 6.0, $T = 25^\circ\text{C}$.

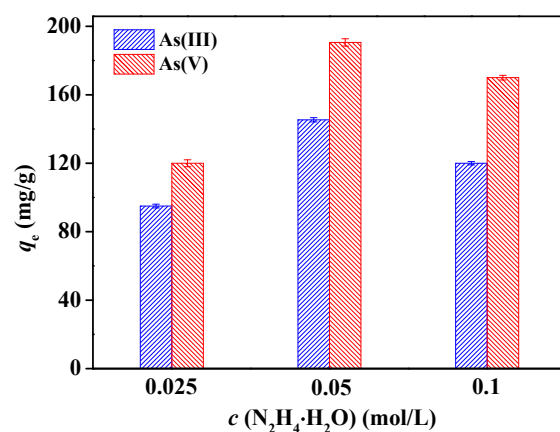


Fig. S4 Effect of hydrazine hydrate concentrations on the adsorption of As(III) and As(V). Adsorbent dose = 0.2 g/L, $c(\text{As})_0 = 50$ mg/L, Initial solution pH = 6.0, $T = 25^\circ\text{C}$.

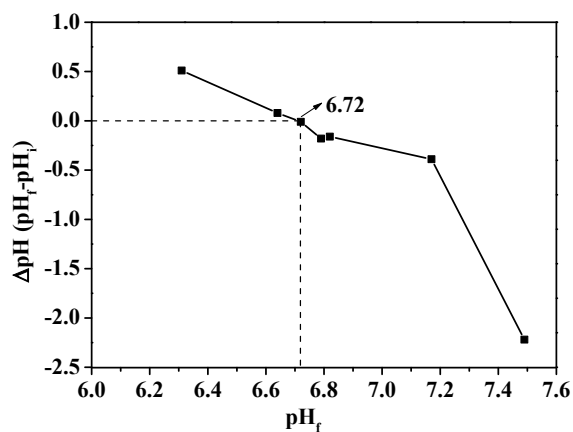


Fig. S5 The point of zero charge (PZC) of S-FeCuLaO.

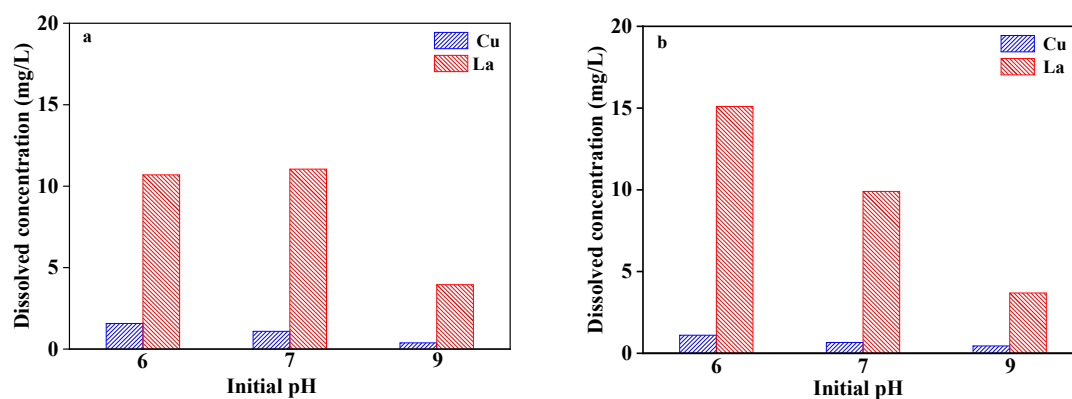


Fig. S6 The concentrations of Cu and La ions leaching from S-FeCuLaO after the adsorption of As(III) (a) and As(V) (b) adsorption. Adsorbent dose = 0.2 g/L, $c(\text{As})_0 = 10$ mg/L, $T = 25^\circ\text{C}$.

Table S1 Main parameters of the well water from Hangzhou, China

Items	Value	Items	Value
TOC (mg/L)	2.04	Cl ⁻ (mg/L)	28.34
pH	6.66	NO ₃ ⁻ (mg/L)	34.87
Ca ²⁺ (mg/L)	23.31	SO ₄ ²⁻ (mg/L)	8.35
Mg ²⁺ (mg/L)	4.18	PO ₄ ³⁻ (mg/L)	Not detected
As (mg/L)	Not detected		