

1 **Supplementary Materials**

2 **Table S1.** H₂S Removal Characteristics of the Original and Alkaline Impregnated Adsorbents

Adsorbent	Impregnated alkali	Concentration of alkali solution for impregnation (M, mol/L)	Loaded amount of alkali on rice hull biochar (g/g)	Breakthrough time (min)	H ₂ S removal capacity (mg/g)
Rice hull biochar (BC)	-	-	-	0.19 ± 0.01	2.73 ± 0.10
Activated carbon (AC)	-	-	-	33.58 ± 0.46	7.65 ± 0.16
Impregnated activated carbon (IAC)	NaOH	5	-	72.28 ± 0.26	14.38 ± 0.19
		1	0.15	6.19 ± 0.01	10.54 ± 0.19
		2	0.24	15.18 ± 0.00	13.50 ± 0.03
		3	0.35	28.48 ± 1.36	18.65 ± 0.32
	NaOH	4	0.51	34.37 ± 1.43	21.67 ± 0.44
		5	0.88	42.35 ± 0.00	24.41 ± 0.05
		6	0.97	35.34 ± 1.39	19.80 ± 0.30
		7	1.16	32.25 ± 1.41	16.25 ± 0.51
		10	1.48	30.21 ± 0.00	12.66 ± 0.06
Impregnated rice hull biochar (IBC)	KOH	1	0.08	6.18 ± 0.00	9.73 ± 0.05
		2	0.16	12.13 ± 0.00	9.41 ± 0.01
		5	0.68	32.53 ± 0.08	19.33 ± 0.04
		10	1.21	20.59 ± 2.83	11.07 ± 1.15
	Na ₂ CO ₃	1	0.04	9.14 ± 0.00	10.03 ± 0.05
		2	0.21	12.18 ± 0.00	12.36 ± 0.03
	K ₂ CO ₃	1	0.07	9.18 ± 0.00	8.81 ± 0.02
		2	0.13	12.21 ± 0.00	11.21 ± 0.04
		5	0.18	27.24 ± 0.00	5.52 ± 0.04

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