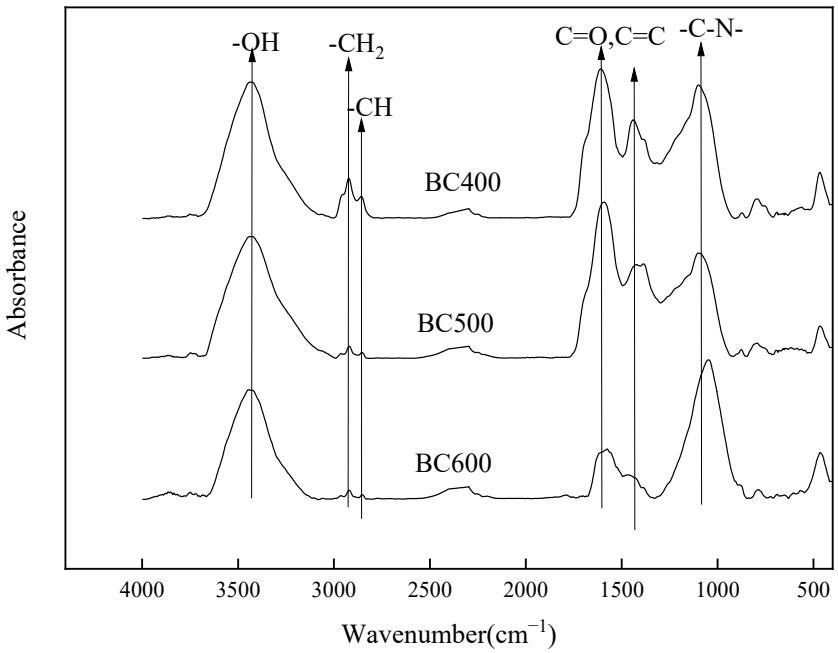

Figure.S1 FTIR spectra of BC produced at different temperatures

Table S1 Elemental analysis of BC produced at different temperatures

Biochar	Elements (%)					Atomic ratio		Ash(%)	Specific surface area (m^2/g)	)pH
	N	C	H	S	O	H/C	O/C			
BC400	1.41	55.20	4.23	0.15	21.30	0.92	0.29	13.12	14.83	7.6
BC500	1.36	67.30	3.21	0.17	16.13	0.57	0.18	16.02	50.41	8.35
BC600	1.17	73.20	1.98	0.18	14.10	0.32	0.14	20.14	80.12	9.78
BC700	1.21	77.60	1.28	0.15	12.02	0.20	0.12	24.13	85.03	10.32

Table S2 Comparison of the adsorption capacities of Cr(VI) and Cd(II) by different adsorbents

Adsorbents	Isotherm model	pH	Heavy metal Adsorption capacity (mg/g)		Ref.
			Cd(II)	Cr(VI)	
Magnetite NPs	Freundlich	6.98	3.00	4.65	Silva et al.(2014) [1]
Sunflower head carbon (SHC)	Langmuir	6	0.06	0.02	Jain et al.(2016) [2]
Sunflower stem carbon (SSC)	Langmuir	6	0.09	0.05	
Halomonas BVR1 immobilized in chitosan	Langmuir	6.8	23.88	—	Manasi et al.(2015) [3]
Chitosan	Langmuir	6.8	13.84	—	
HCB/TiO2	Langmuir	2	—	27.33	Zhang and Zhang(2014) [4]
Polyaniline grafted chitosan (PGC)	Langmuir	6	14.33	—	Karthik and Meenakshi(2015) [5]
Ferrihydrite (Fh)	Langmuir	4.5	—	12.97	Ni et al.(2016) [6]
Al-substituted Ferrihydrite (FAh)	Langmuir	4.5	—	39.79	
Chitosan-coated cotton gauze	Langmuir	3	—	12.40	Ferrero and Tonetti(2014) [7]
NaZ-nZVI	Langmuir	4.26	20.60	—	Tasharrofi et al.(2020) [8]
BC-SnZVI	Langmuir	5	32.55	43.10	Present study

Table S3 Assignment of the vibrational bands in the FTIR spectra

Functional groups	Peak position	Ref.
-OH	3440cm^{-1}	Wang et al. (2015) [9]
-COOH	1383cm^{-1}	Yang et al. (2018) [10]
C-O	1119cm^{-1}	Lyu et al. (2017) [11]
Fe-O	600cm^{-1}	Qu et al. (2021) [12]
Fe-S	473cm^{-1}	Yang et al. (2014) [13]

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