

## Captions

Figure captions

**Fig. S1.** Effect of pH (a), temperature (b) and initial Cd<sup>2+</sup> concentration (c) and contact time (d) on adsorption by *Synechocystis* sp. PCC6803

**Fig. S2.** Desorption of biosorbents after Cd<sup>2+</sup> adsorption using different desorption solutions

Table captions

**Table S1** Fluorescence spectral parameters of EPS from *Synechocystis* sp. PCC6803 during different culture time exposure to Cd<sup>2+</sup>

**Table S2** Components and contents of exopolysaccharides before (a) and after (b) Cd<sup>2+</sup> adsorption

**Table S3** Characteristic peak wavenumber (cm<sup>-1</sup>) of FTIR before and after Cd<sup>2+</sup> adsorption

**Table S4** Binding energy and atomic contents from XPS before and after Cd<sup>2+</sup> adsorption on *Synechocystis* sp. PCC6803

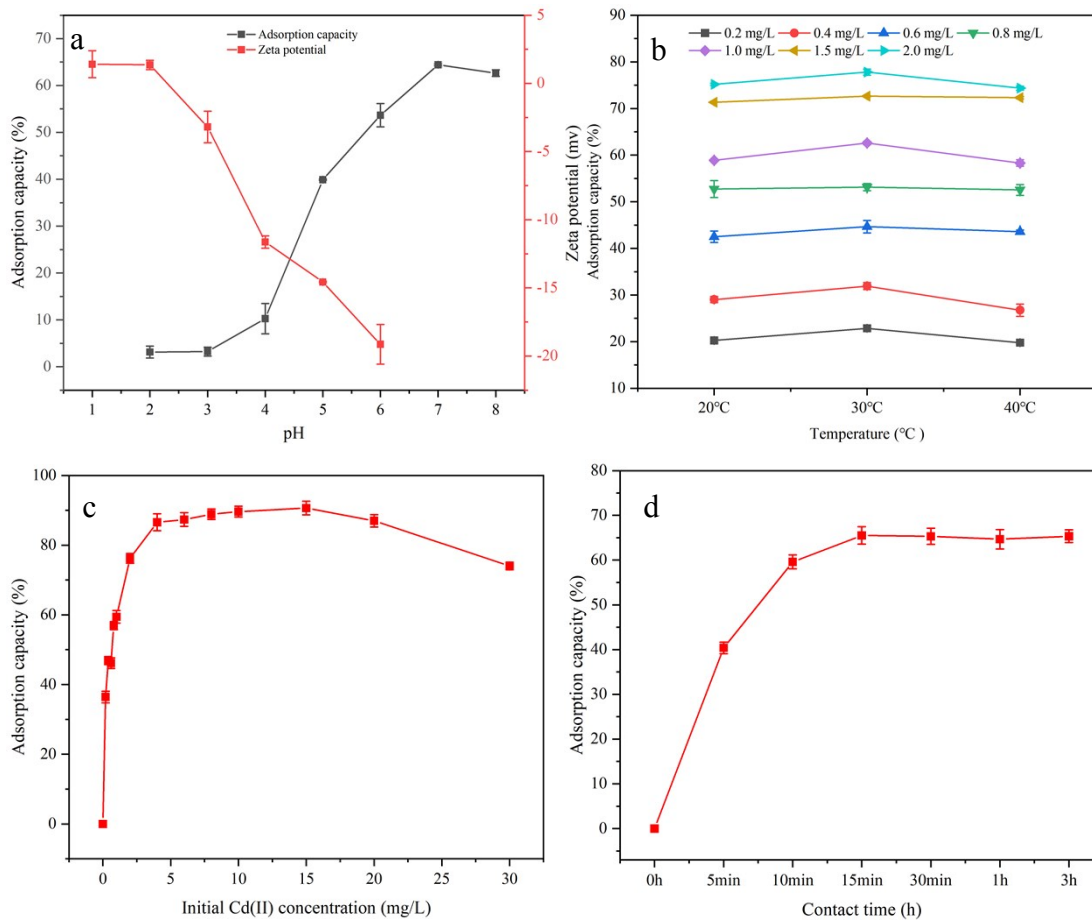


Fig. S1. Effect of pH (a), temperature (b) and initial Cd<sup>2+</sup> concentration (c) and contact time (d) on adsorption by *Synechocystis* sp. PCC6803

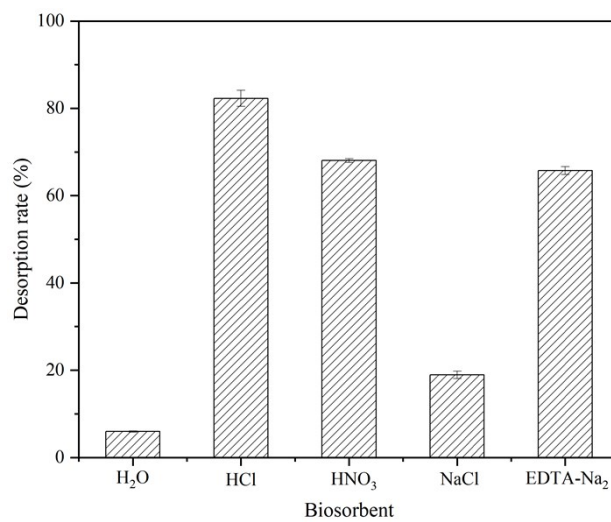


Fig. S2. Desorption of biosorbents after Cd<sup>2+</sup> adsorption using different desorption solutions

Table S1 Fluorescence spectral parameters of EPS from *Synechocystis* sp. PCC6803 during different  
 cluture time exposure to Cd<sup>2+</sup>

1.0 mg/L sample	Peaks	Ex/Em(nm)	Intensity	Corresponding peaks
Control-EPS	A	270.0/460.0	718.4	Humic acid -like
	B	360.0/460.0	411.0	Humic acid
	C	280.0/350.0	189.9	Tryptophan
	D	230.0/340.0	56.45	Tyrosine
15 min-EPS	A	260.0/460.0	1000	Humic acid -like
	B	360.0/460.0	548.3	Humic acid
	C	280.0/340.0	171.0	Tryptophan
	D	230.0/330.0	82.12	Tyrosine
24 h-EPS	A	270.0/460.0	1003	Humic acid -like
	B	360.0/460.0	577.9	Humic acid
	C	280.0/360.0	198.0	Tryptophan
	D	220.0/330.0	115.5	Tyrosine
48 h-EPS	A	280.0/450.0	1208	Humic acid -like
	B	360.0/460.0	562.7	Humic acid
	C	280.0/360.0	193.1	Tryptophan
	D	230.0/320.0	149.8	Tyrosine
72 h-EPS	A	280.0/450.0	1494	Humic acid -like
	B	350.0/450.0	538.4	Humic acid
	C	280.0/360.0	193.0	Tryptophan
	D	220.0/330.0	174.1	Tyrosine
96 h-EPS	A	280.0/460.0	1003	Humic acid -like
	B	350.0/460.0	352.0	Humic acid
	C	280.0/380.0	170.6	Tryptophan
	D	220.0/340.0	177.9	Tyrosine
	E	320.0/380.0	173.5	Humic acid-like

Table S2 Components and contents of exopolysaccharides before (a) and after (b) Cd<sup>2+</sup> adsorption

Name	Cyanobacteria			Cyanobacteria with Cd <sup>2+</sup>		
	Time	Peak area	Content (mg/L)	Time	Peak area	Content (mg/L)
Fuc	4.359	0.693	3.62	4.375	0.622	3.25
GalN	8.2	1.478	3.78	8.234	1.275	3.26
Rha	8.709	0.29	2.59	8.725	0.397	3.54
Ara	9.35	0.487	2.33	9.367	1.025	4.90
GlcN	10.35	2.312	4.21	10.384	2.183	3.98
Gal	11.725	3.159	18.90	11.842	4.255	25.46
Glc	13.35	6.275	108.23	13.45	6.040	104.17
GlcNAc	14.859	0	0.00	14.859	0	0.00
Xyl	15.717	0.721	3.95	15.809	0.629	3.45
Man	16.384	0.481	4.96	16.6	0.519	5.35
Fru	22.025	0	0.00	22.025	0	0.00
Rib	27.475	0	0.00	27.475	0	0.00
GalA	42.142	0.201	2.18	42.059	0.468	5.06
GulA	42.509	0	0.00	42.509	0	0.00
GlcA	44.609	0.112	1.36	44.417	0.139	1.69
ManA	46.675	0	0.00	46.675	0	0.00

Table S3 Characteristic peak wavenumber (cm<sup>-1</sup>) of FTIR before and after Cd<sup>2+</sup> adsorption

Time	OH	CH	CONH	NH	CH	C=O	PO <sup>2-</sup>	C-O-C
control	3314.99	2928.42	1654.60	1544.25	-	1403.68	1251.27	1056.35
15 min	3317.15	2928.54	1654.03	1543.81	-	1403.90	1244.96	1053.03
24 h	3315.98	2927.46	1654.91	1543.45	-	1403.18	1244.26	1042.83
48 h	3317.16	2927.67	1655.32	1543.12	1453.01	1400.89	1243.57	1038.06
72 h	3305.22	2927.31	1655.20	1543.38	1452.58	1399.16	1242.78	1079.71
96 h	3305.51	2927.63	1655.36	1542.76	1452.38	1398.17	1242.53	1079.71

Table S4 Binding energy and atomic contents from XPS before and after Cd<sup>2+</sup> adsorption on

*Synechocystis* sp. PCC6803

Element	Assignment	Be (eV)	Atomic (%)	Be (eV)	Atomic (%)
		Before adsorption		After adsorption	
C 1s	C-C	283.15	62.65	283.14	66.94
	C-O	284.65	18.01	284.67	15.90
	C=O	286.22	19.34	286.19	17.16
O 1s	C=O	529.51	37.76	529.51	29.53
	C-OH	530.23	39.82	530.26	41.41
	C-O	531.04	22.42	531.06	29.06
N 1s	-NH	398.23	75.68	398.22	86.68
	-NH <sub>2</sub>	398.35	24.32	403.41	13.32