Supplementary information

Synthesis of cellulose–poly(acrylic acid) using sugarcane bagasse extracted cellulose fibres for the removal of heavy metal ions

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Swelling Capacity

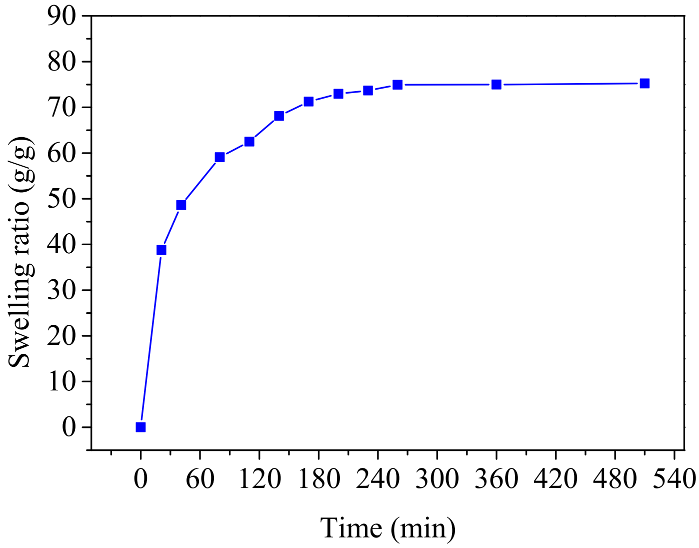

Figure S1. Swelling ratios of CE-PAANa

The swelling ratio of the sample was measured by immersing 0.2 g of hydrogel into 200 mL of water to reach equilibrium in a beaker (20 ℃), and the weight of the swollen hydrogel was measured after removing excess water which had not penetrated into the hydrogel by a mesh sieve at different contact time until equilibrium. The swelling ratio of hydrogels can be calculated as SR = $(W_s - W_d)/W_d$, where W_s and W_d represent the weights of swollen hydrogels and dry hydrogels, respectively.

The CE-PAANa had swelling capacity of 75 g/g in distilled water, as shown in Fig. S2. As shown in Table S1, the low swelling ratio of CE-PAANa is due to the access to a large amount of cellulose. This is because the addition of CE leads to a shrinkage of the hydrogel pores, which slows the entry of water[1, 2].

Table S1. The swelling capacity in distilled water reported for some grafted PAA

Materials	**Equilibrium swelling ratio (g·g−1)**	**Ref.**
Pb (II) P(AANa-co-AM)/GO	282.2	[3]
HEC-g-P（AA-co-AM）	240	[4]
WS-g-P（AA-co-AM）	200	[5]
CE-PAANa	75	This study

Table S2. Gel Permeation Chromatography (GPC) test results for cellulose.

Sample	Method	Retention time (min)	GPC M_n (g/mol)	GPC M_w (g/mol)	GPC M_z (g/mol)	GPC M_{z+1} (g/mol)	GPC M_η (g/mol)	Dispersity M_w/M_n
CE	DMSO-PMMA	8.6471	6678	9599	12973	16415	9134	1.4374

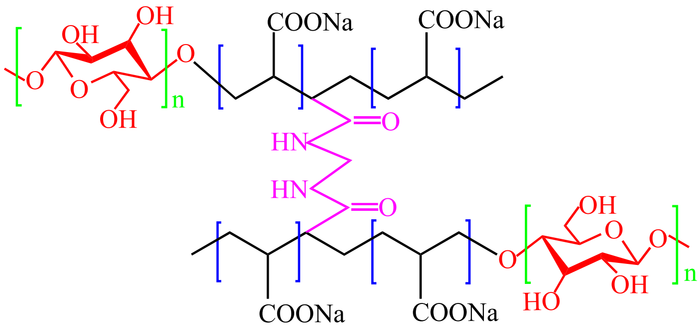

Figure S2. Schematic diagram of the structure of CE-PAANa

References

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