

Effective control of the carbon releasing of starch/polyvinyl alcohol based on the polyamide coating in solid-phase denitrification

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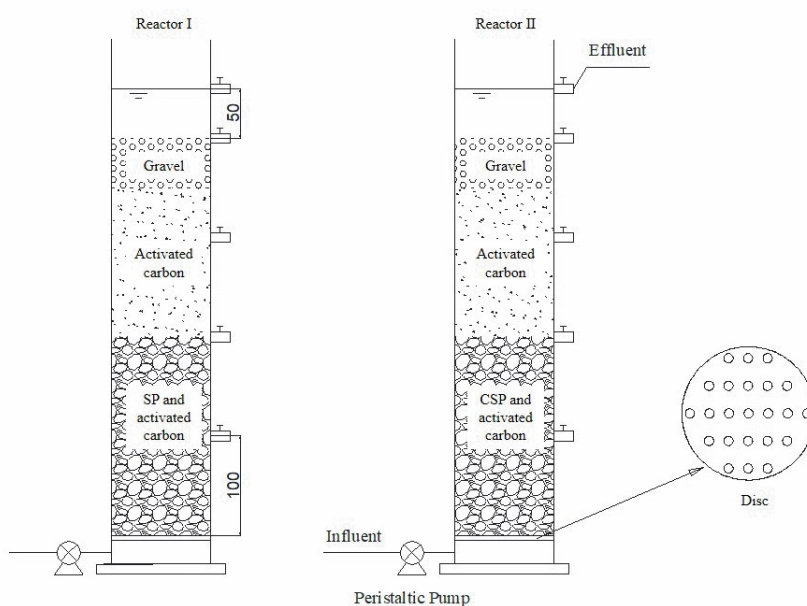


Fig. S1 Experimental set-up. (Reactor I, filled with SP carbon source; Reactor II, filled with CSP carbon source)

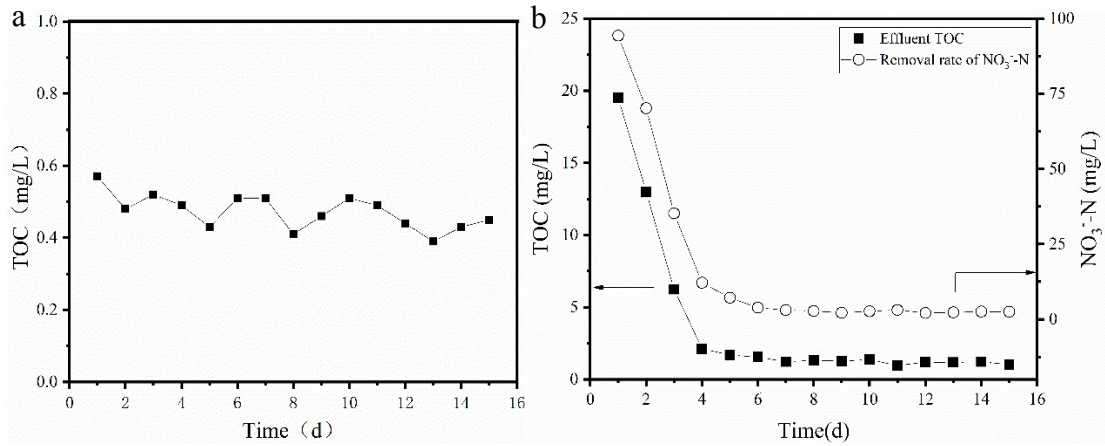


Fig. S2 Leaching performance of PVA (a) and denitrification performance of the batch test (b).

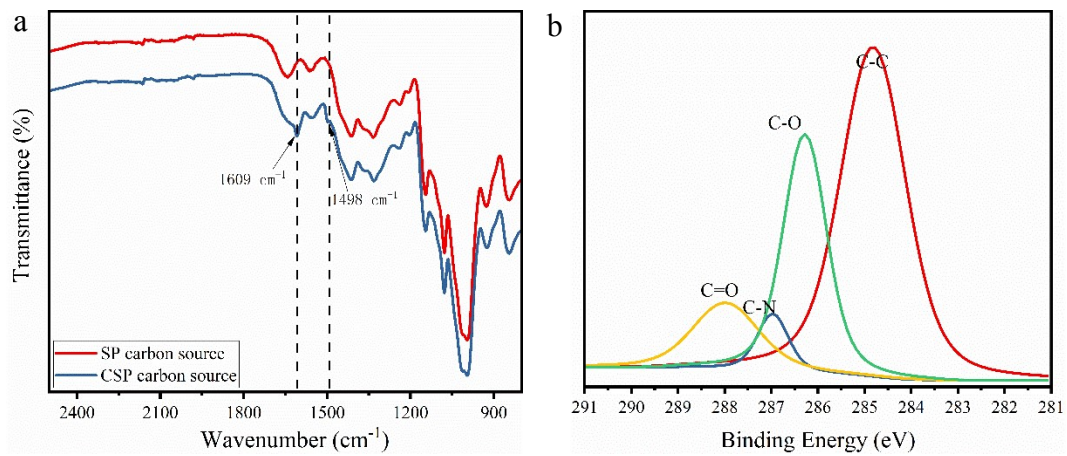


Fig. S3 (a) FTIR spectra of SP and CSP carbon source and (b) XPS spectra of CSP carbon source.

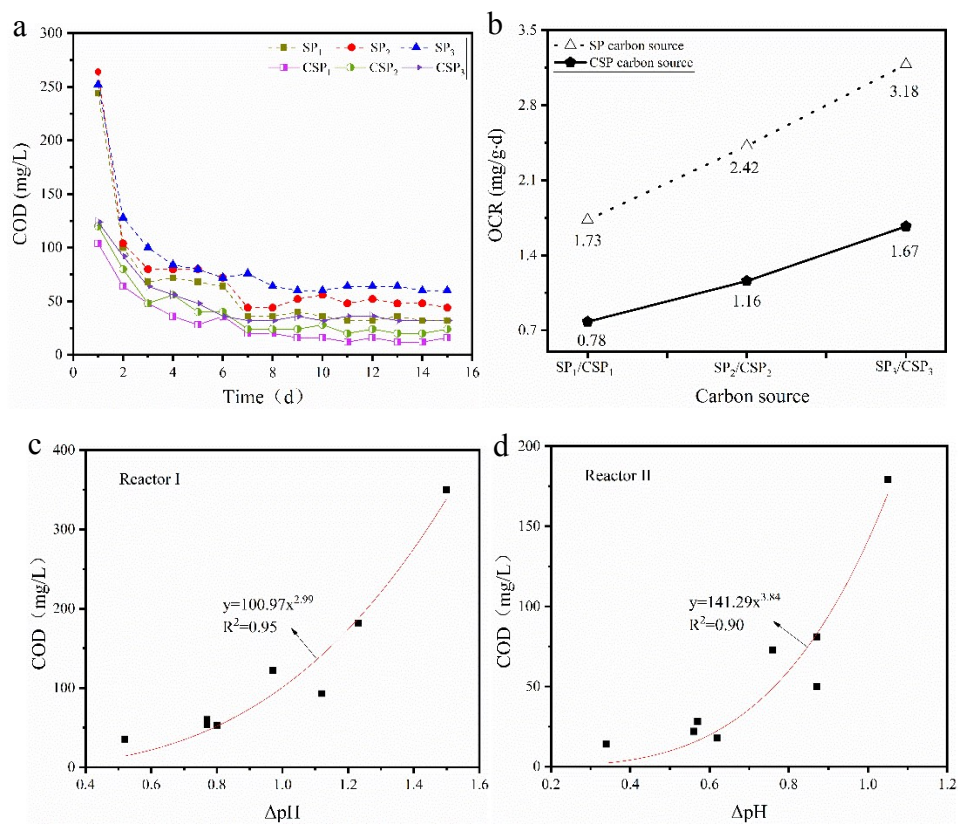


Fig. S4 COD releasing concentration (a) and rate (b) of the different carbon sources in leaching experiments; relationship between average effluent pH and average COD at different stages in continuous flow experiment (c)(d).

Table S1 The operating conditions and denitrification performance of reactor I and reactor II under different operation stages.

Time (days)	Phase	NO ₃ ⁻ -N (mg/L)	NO ₂ ⁻ -N (mg/L)	NH ₄ ⁺ -N (mg/L)	TN (mg/L)	COD (mg/L)	NRR (%)	DR (gN/(L·d))
Reactor I								
I								
1-30	Startup	1.32±1.32	0.026±0.026	0.98±0.27	2.21±1.45	308±60	95.68±2.81	0.062±0.010
31-40	I	1.99±1.05	0.006±0.006	1.88±0.99	3.44±0.71	192±24	93.25±1.47	0.092±0.003
41-50	II	1.41±0.63	0.003±0.003	1.33±0.16	2.64±0.63	124±8	94.77±1.24	0.140±0.003
51-60	III	16.81±1.08	3.081±2.035	0.09±0.04	19.26±2.01	94±6	62.78±3.73	0.207±0.033
61-80	IV	2.58±2.03	0.012±0.012	0.06±0.04	2.60±2.03	59±5	94.93±3.93	0.092±0.006
81-90	V	2.83±0.20	0.018±0.018	0.04±0.01	2.88±0.18	52±2	94.30±0.34	0.130±0.011
91-100	VI	29.74±9.28	1.819±1.041	0.04±0.01	32.20±9.19	37±1	36.44±18.94	0.108±0.057
101-120	VII	2.26±0.77	0.113±0.113	0.0225	2.41±0.68	55±5	95.24±1.38	0.129±0.014
Reactor II								
II								
1-30	Startup	1.63±1.63	0.003±0.003	0.63±0.31	2.10±1.79	158±14	95.89±3.49	0.059±0.014
31-40	I	2.68±1.58	0.009±0.009	1.19±0.59	3.78±1.10	82±6	92.68±2.11	0.092±0.002
41-50	II	1.63±0.65	0.004±0.04	0.90±0.12	2.56±0.67	70±6	94.94±1.32	0.140±0.003
51-60	III	18.52±0.71	3.687±1.934	0.08±0.03	22.55±2.03	52±4	55.74±4.52	0.185±0.036
61-80	IV	3.84±2.82	0.010±0.010	0.05±0.03	2.86±2.82	30±10	92.49±5.47	0.091±0.006
81-90	V	2.79±0.47	0.051±0.028	0.04±0.01	2.87±0.45	16±0	94.40±0.80	0.129±0.012
91-100	VI	29.95±6.78	1.942±0.911	0.04±0.01	31.57±6.55	14±2	38.51±12.97	0.114±0.040
101-120	VII	2.36±0.91	0.114±0.111	0.0225	2.39±0.91	22±2	95.33±1.71	0.128±0.015