Supplementary Information

Tetracycline Degradation by Persulfate Assisted by Fe and N Co-Doped Biochar Derived from Spent Mushroom Substrate for Sustainability: Effect of Pyrolysis Temperature

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Text S1: Analytical methods for TC degradation intermediates.

Figure S1: TOC removal efficiency of Fe-N-BC-900/PS system.

Table S1: Comparison of antibiotics removal by Fe/N co-doped BCs.

Text S1 Analytical methods for TC degradation intermediates

The intermediate products in TC degradation process were identified by LC-MS (Agilent 1290UPL for LC and Agilent QTOF 6550 for MS) with waters cortecs C18 (2.1×50 mm, 1.7 μm) chromatographic column. The injection volume is 10 μL and the column temperature was 30 °C. The eluents were composed of 0.1% of formic acid in water (eluent A) and acetonitrile (eluent B). The TC fragmentation data were collected by the positive spray ionization (ESI^+) mode with scanning range of 50-1000 m/z.

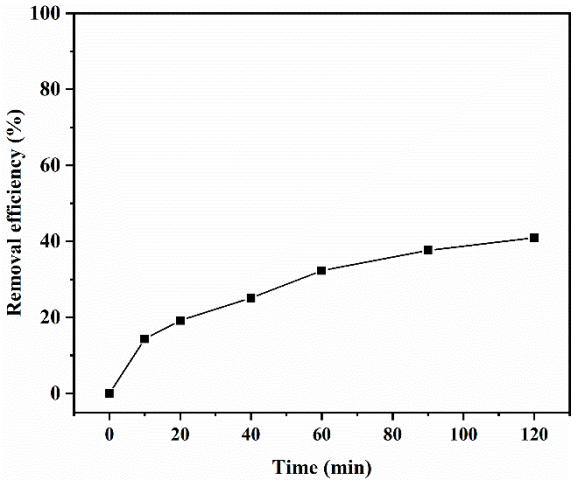


Figure S1. TOC removal efficiency of Fe-N-BC-900/PS system.

Table S1. Comparison of antibiotics removal by Fe/N co-doped BCs.

Biomass	Catalyst	Antibiotic	Synthesis condition	Reaction condition	Removal rate	Ref.
Shiitake SMS	Fe-N-BC	TC	Pyrolysis at 300, 600, and 900 ℃ for 2 h	TC=20 mg/L; PS=2 mM; catalyst=0.2 g/L; pH=7; T=25℃	95% in 120 min	this work
Sewage sludge	MS-biochar	TC	Pyrolysis at 400, 600, and 800 ℃ for 2 h at 5 ℃/min in N_2	TC=100 mg/L; PS=4.2 mM; catalyst=0.2 g/L; pH=2.17; T=25℃	83% in 3h	[1]
Corn stalks	MNBC	CIP	Pyrolysis at 600–800 ℃ for 3 h with 10 ◦C/min in N_2	CIP=10 mg/L; PS=0.2g /L; catalyst=0.8 g/L; pH=4.99; T=25℃	92.6% in 80 min	[2]
Raw silk	PGBF-N	TC	Calcination at 900 ℃	TC=20 mg/L; PS=1 mM; catalyst=0.1 g/L; T=25℃	96.5% in 150 min	[3]
Sawdust	Fe-N-C	BPA	Pyrolysis at 800 ℃ for 1 h in N_2	BPA=10 mg/L; PS=0.5 mM; catalyst=0.1 g/L; pH=6.76; T=25℃	97% in 60 min	[4]
Corn straw	FeS_2@NBC	TC	Heating at 120℃ for 24h by hydrothermal method	TC=20 mg/L; PS=0.30 g/L; catalyst=0.07 g/L; pH=6.5;	87.6% in 10 min	[5]
Wood pulp	Fe@N-BC	γ-HCH	Pyrolysis at 500,700 and 900 ℃ at 5 ℃/min for 0.5 h in N_2	γ-HCH=10 mg/L; PS=4 mM; catalyst=1.25 g/L; pH: unadjusted; T=25℃	95.9% in 1 h	[6]
Maize straw	Fe@N-BC	NOR	Carbonization pyrolysis at 600 ℃ for 1 h at 10 ℃/min in N_2	NOR=10 mg/L; PS=10 mM; catalyst=0.1 g/L; pH=7; T=25℃	95% in 20 min	[7]
Rice straw	Fe-NBC	SMX	HTC at 160 ℃ for 10 h, then pyrolysis at 800 ℃ for 2 h in N_2	SMX=10 mg/L; PS=3 mM; catalyst=0.2 g/L; pH=6.2; T=25℃	91.7% in 60 min	[8]
Wheat straw	Fe-N-BC	AO7	HTC at 160 ℃ for 10h, then pyrolysis at 800 ℃ for 1 h in N_2	AO7=20 mg/L; PS=1 mM; catalyst=0.2 g/L; pH=3;	100% in 1.5 h	[9]

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