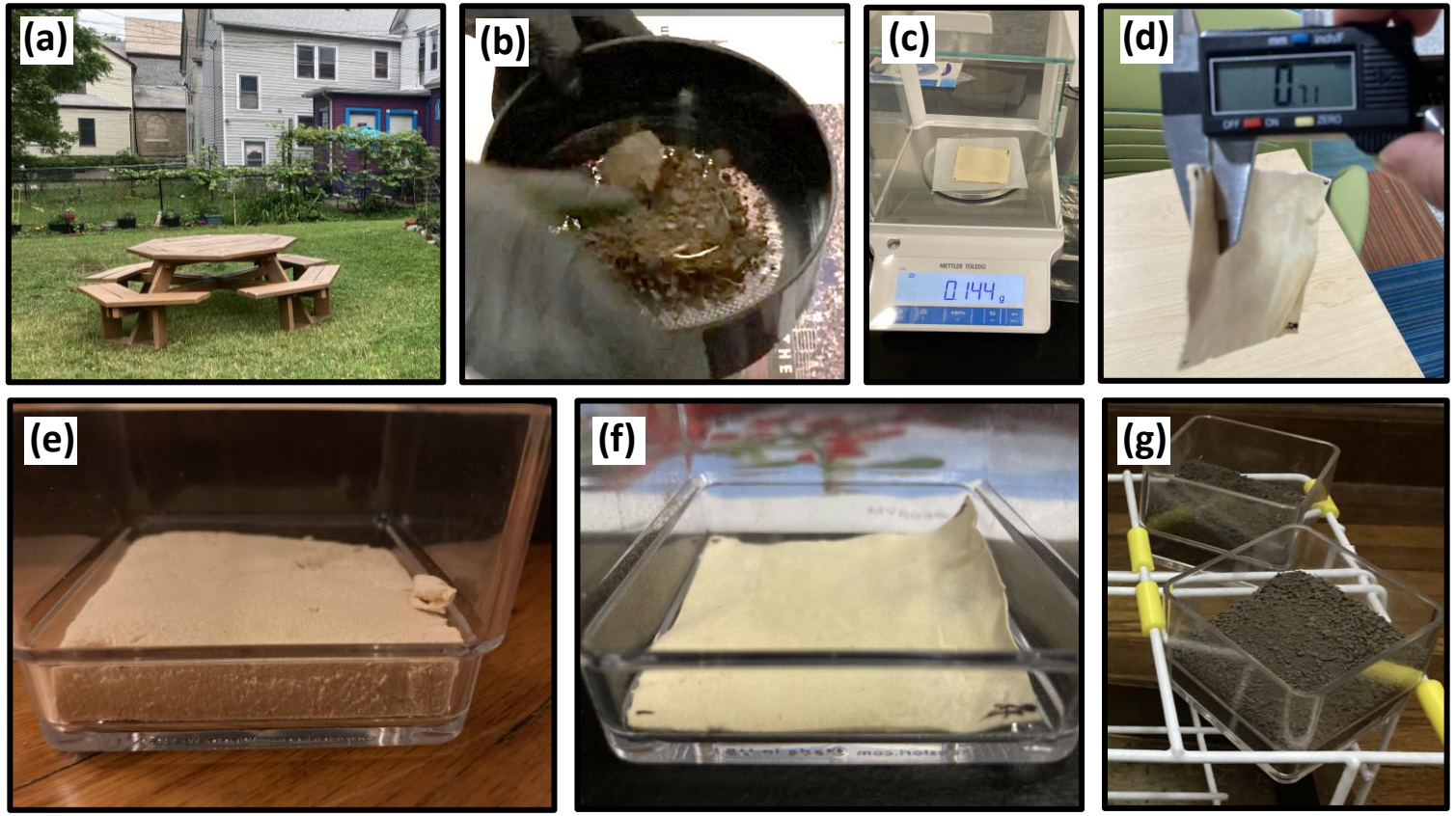


Figure 1: Schematic of mycelium degradation
Lead spiking in soil

Figure 2

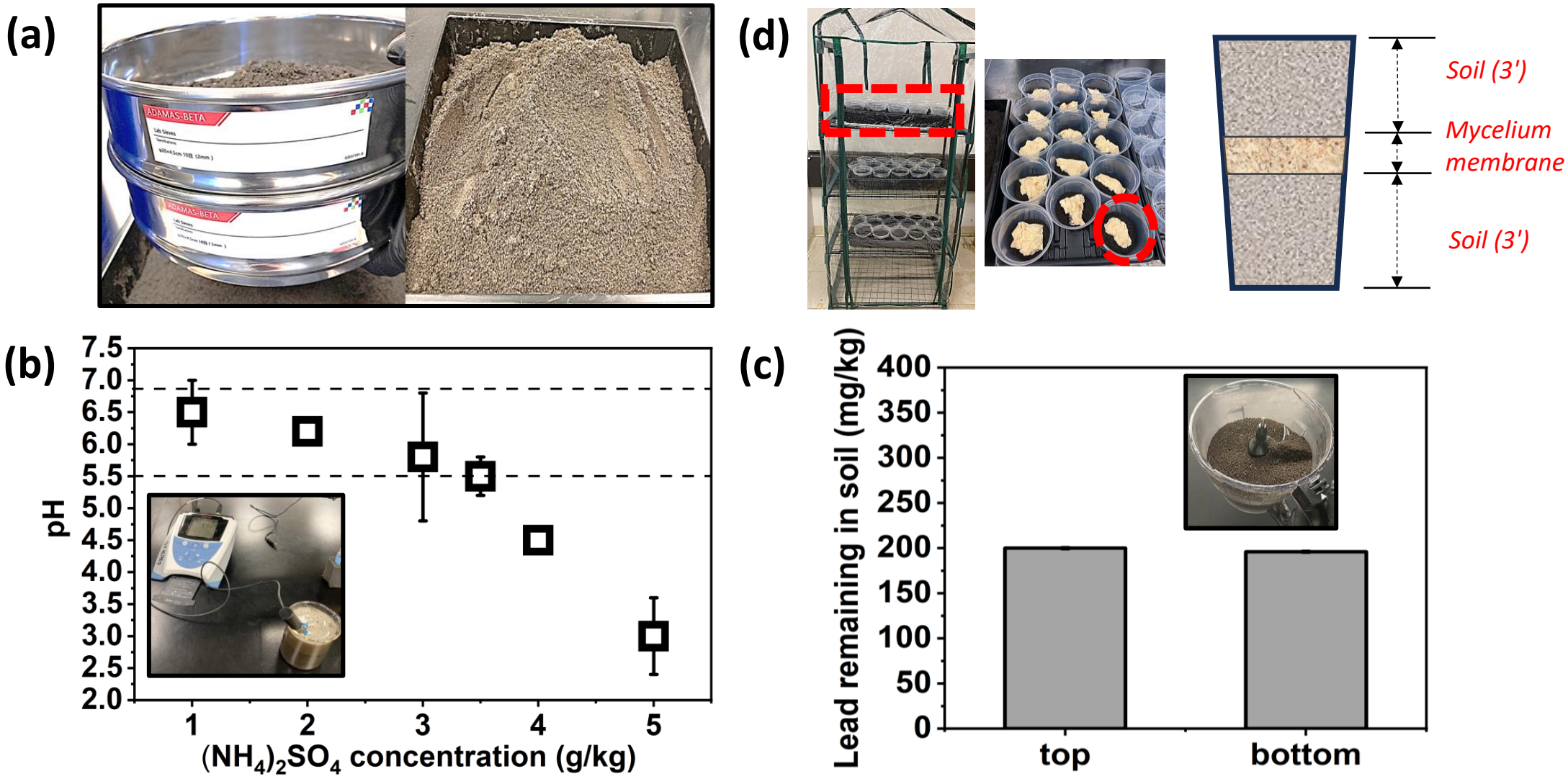
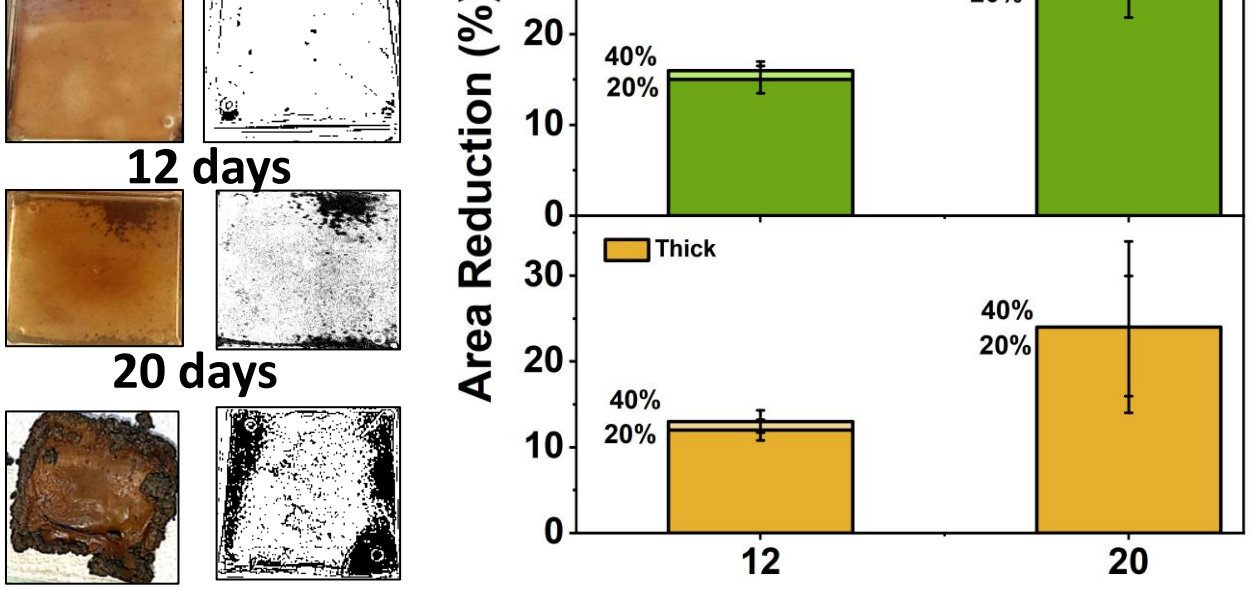
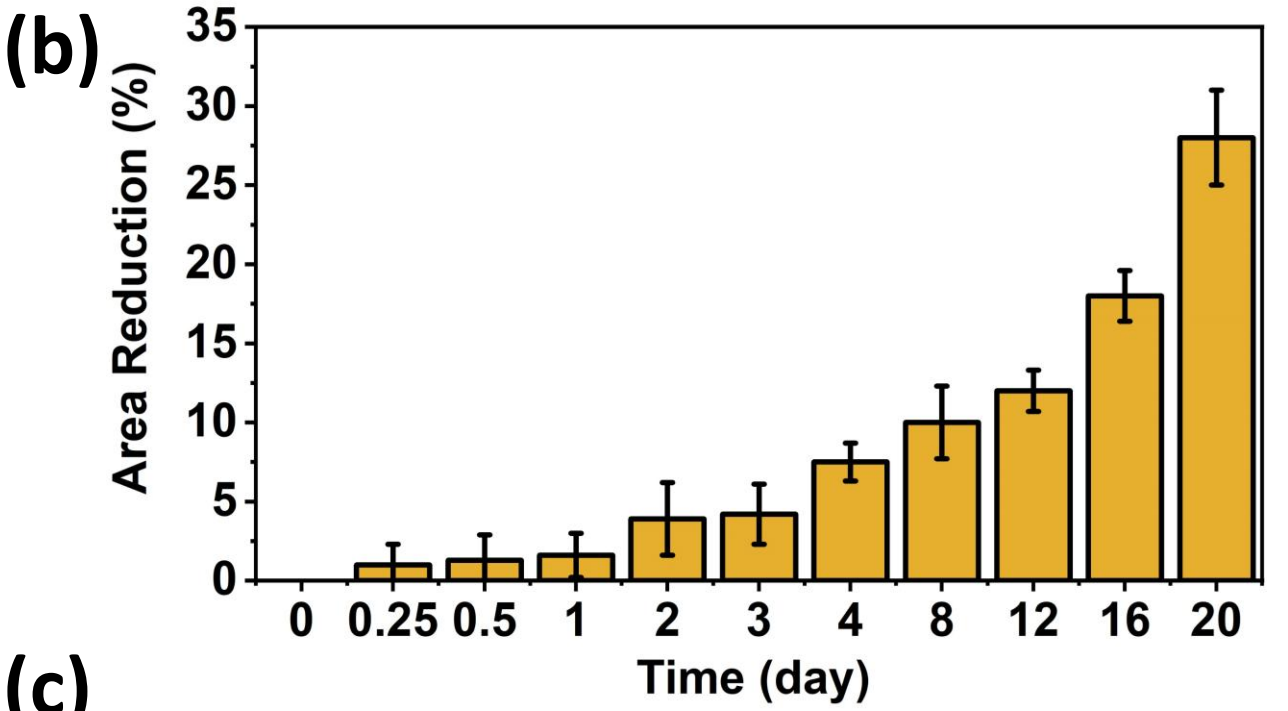

(a)
ADAMAS-BETA
ADAMAS-BETA
(b)
pH
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1
2
3
4
5
(NH4)2SO4 concentration (g/kg)
(c)
Lead remaining in soil (mg/kg)
400
350
300
250
200
150
100
50
0
top
bottom
(d)
Soil (3')
Mycelium membrane
Soil (3')

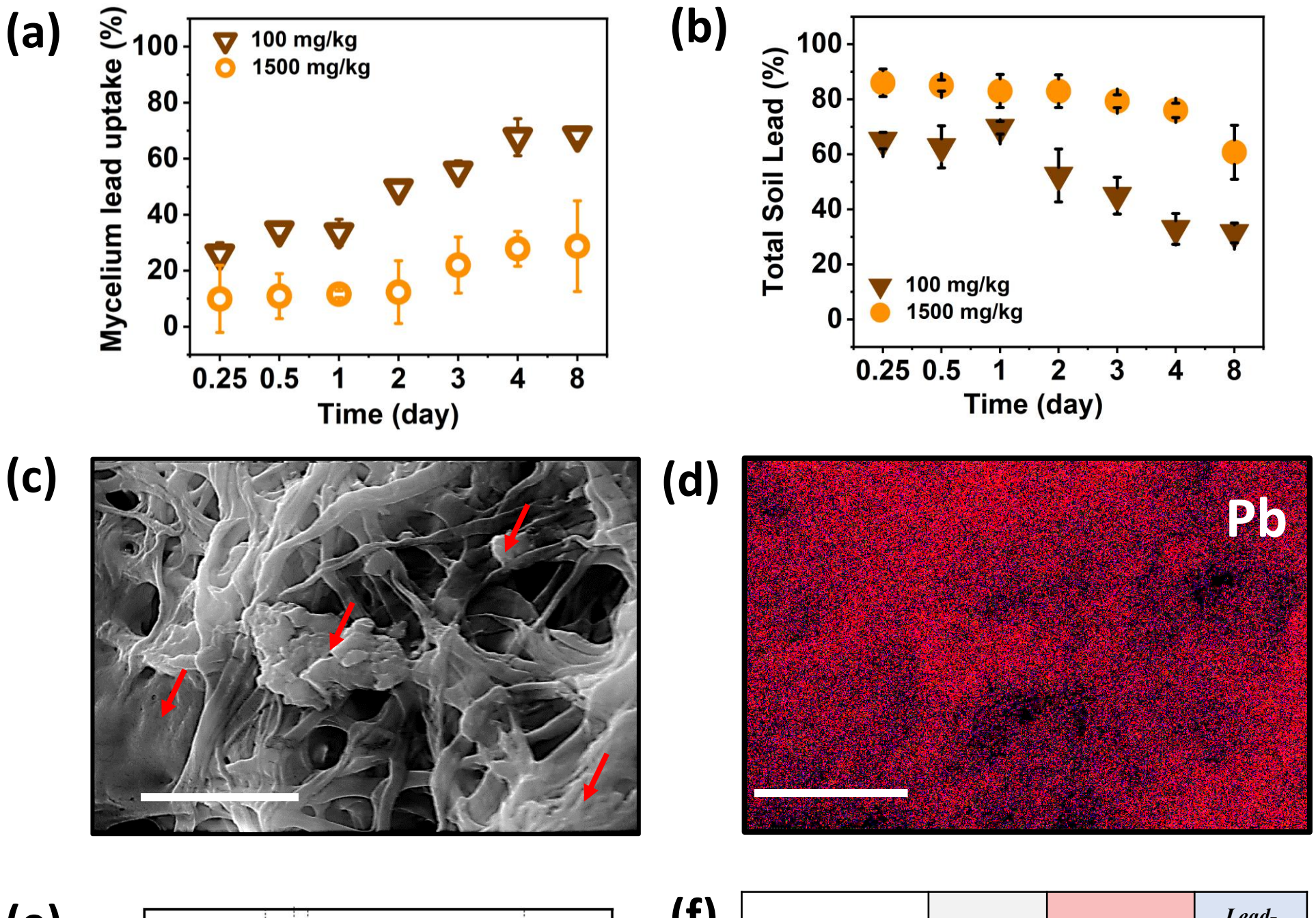
Figure 3

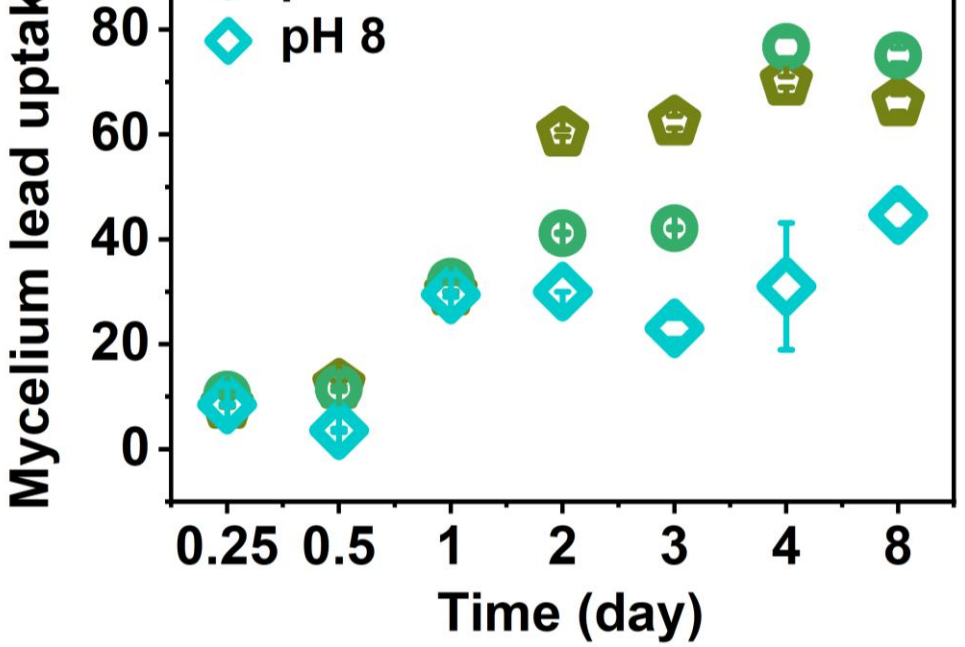

12 days
20 days
Area Reduction (%)
40%
20%
Thick
40%
20%
40%
20%
0
10
20
30
12
20
Time (day)

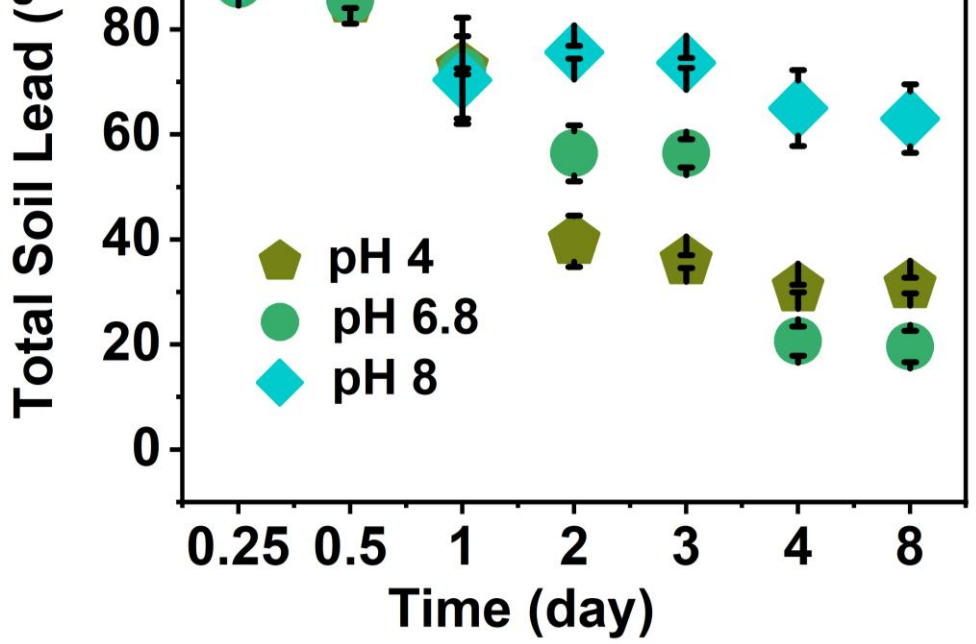

(b)
Area Reduction (%)
0
5
10
15
20
25
30
35
0
0.25
0.5
1
2
3
4
8
12
16
20
Time (day)


(c)
1.2

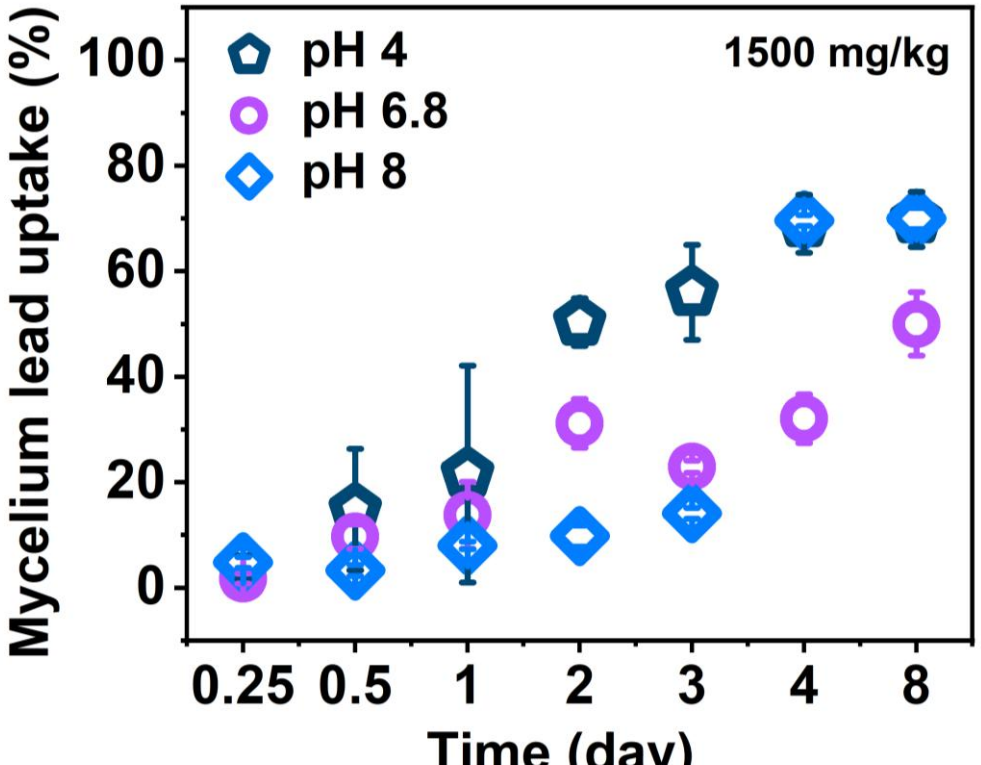
Figure 4


(a)
Mycelium lead uptake (%)
100 mg/kg
1500 mg/kg
Time (day)
(b)
Total Soil Lead (%)
100 mg/kg
1500 mg/kg
Time (day)
(c)
(d)
Pb


Mycelium lead uptak
80
60
40
20
0
pH 8
0.25 0.5 1 2 3 4 8
Time (day)


Total Soil Lead (%
80
60
40
20
0
pH 4
pH 6.8
pH 8
0.25 0.5 1 2 3 4 8
Time (day)

(c)


Mycelium lead uptake (%)
100
80
60
40
20
0
pH 4
pH 6.8
pH 8
1500 mg/kg
0.25 0.5 1 2 3 4 8
Time (day)

(d)

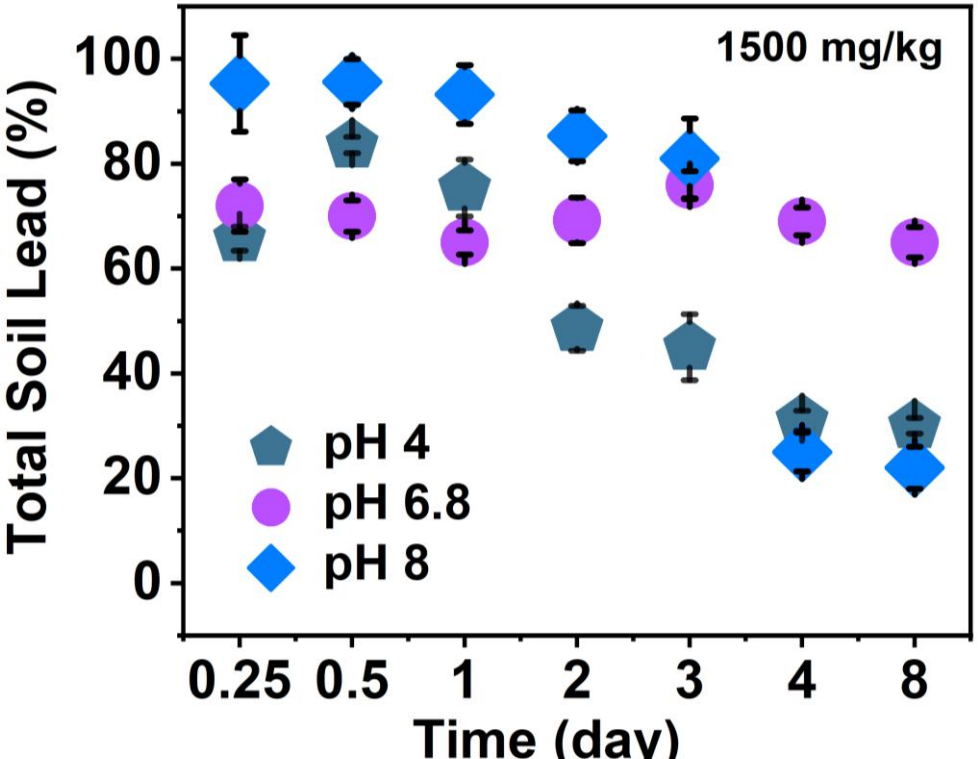

Total Soil Lead (%)
100
80
60
40
20
0
pH 4
pH 6.8
pH 8
1500 mg/kg
0.25 0.5 1 2 3 4 8
Time (day)

Figure 6

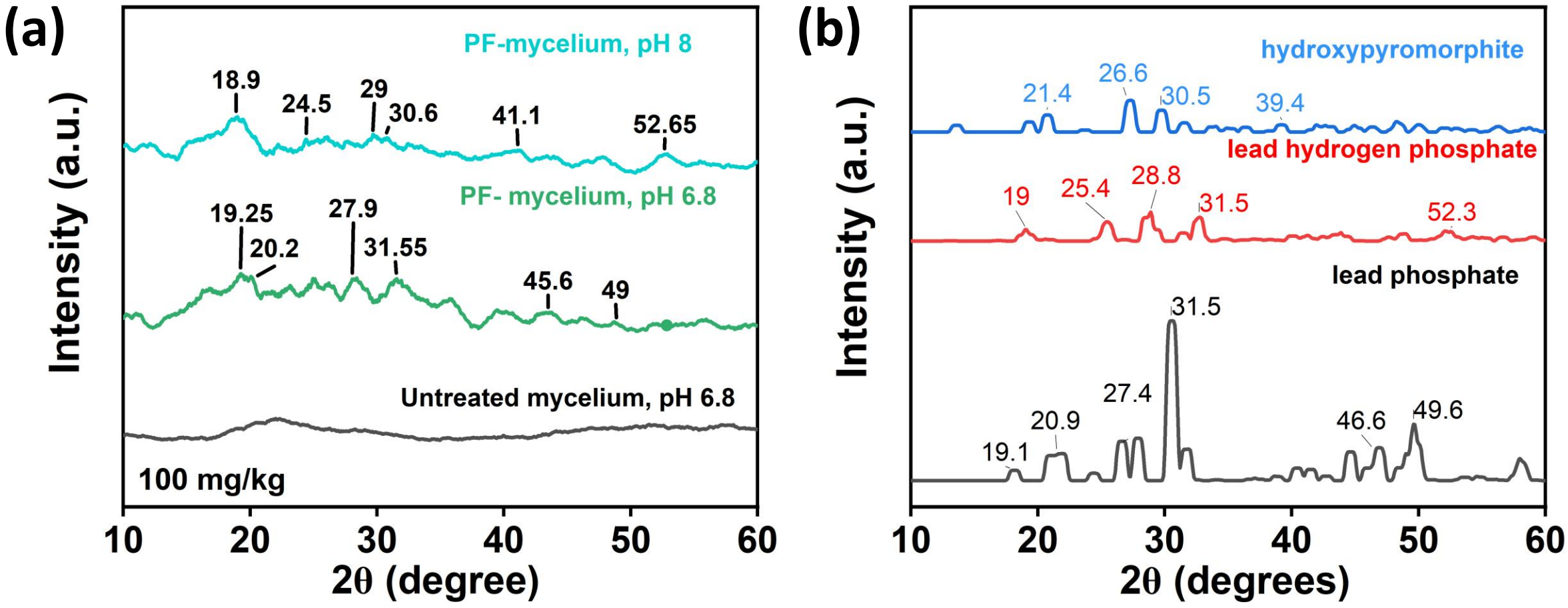
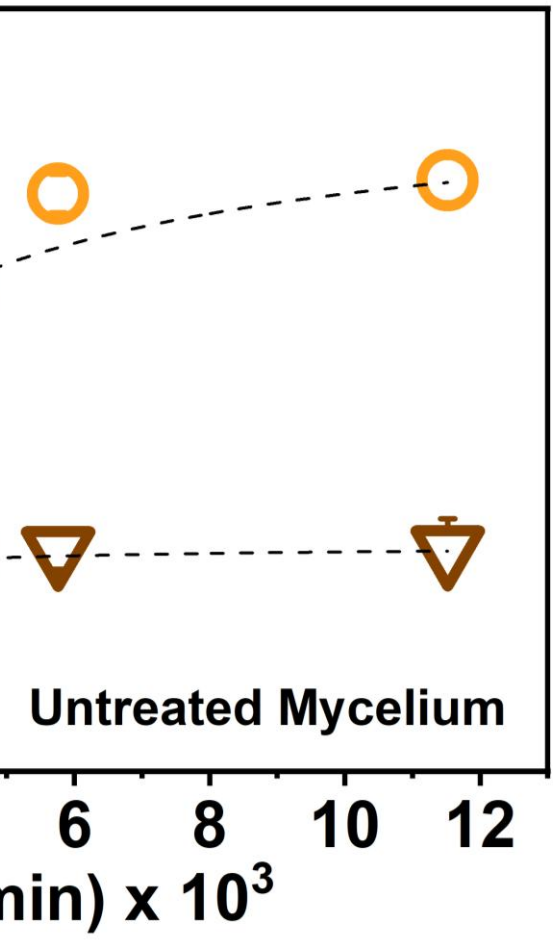
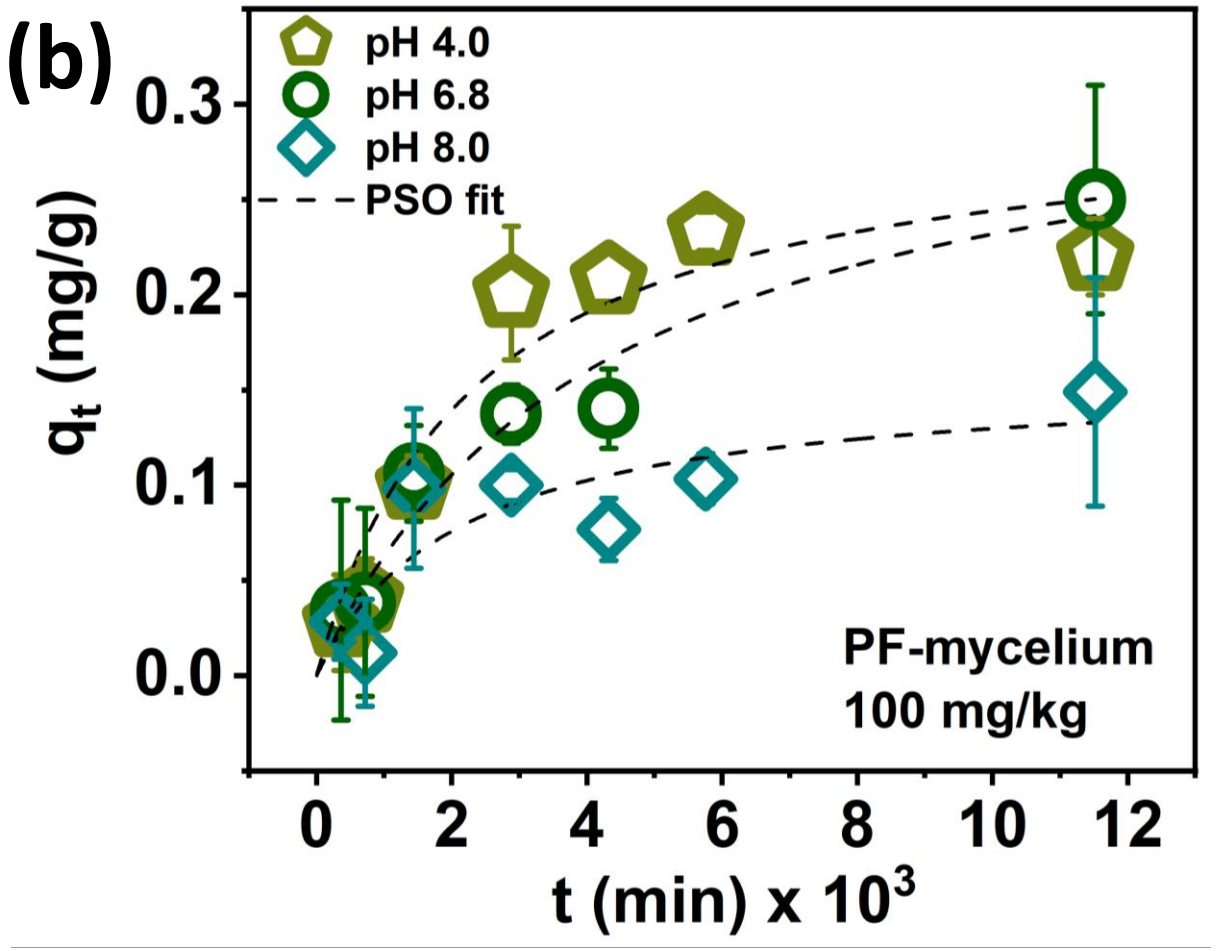

(a)
PF-mycelium, pH 8
18.9
24.5
29
30.6
41.1
52.65
PF- mycelium, pH 6.8
19.25
20.2
27.9
31.55
45.6
49
Untreated mycelium, pH 6.8
100 mg/kg
Intensity (a.u.)
10
20
30
40
50
60
2θ (degree)
(b)
hydroxypyromorphite
21.4
26.6
30.5
39.4
lead hydrogen phosphate
19
25.4
28.8
31.5
52.3
lead phosphate
31.5
27.4
20.9
19.1
46.6
49.6
Intensity (a.u.)
10
20
30
40
50
60
2θ (degrees)

Figure 7


Untreated Mycelium
6
8
10
12
nin) x 10^3


(b)
pH 4.0
pH 6.8
pH 8.0
PSO fit
PF-mycelium
100 mg/kg
q_t (mg/g)
0.0
0.1
0.2
0.3
0
2
4
6
8
10
12
t (min) x 10^3

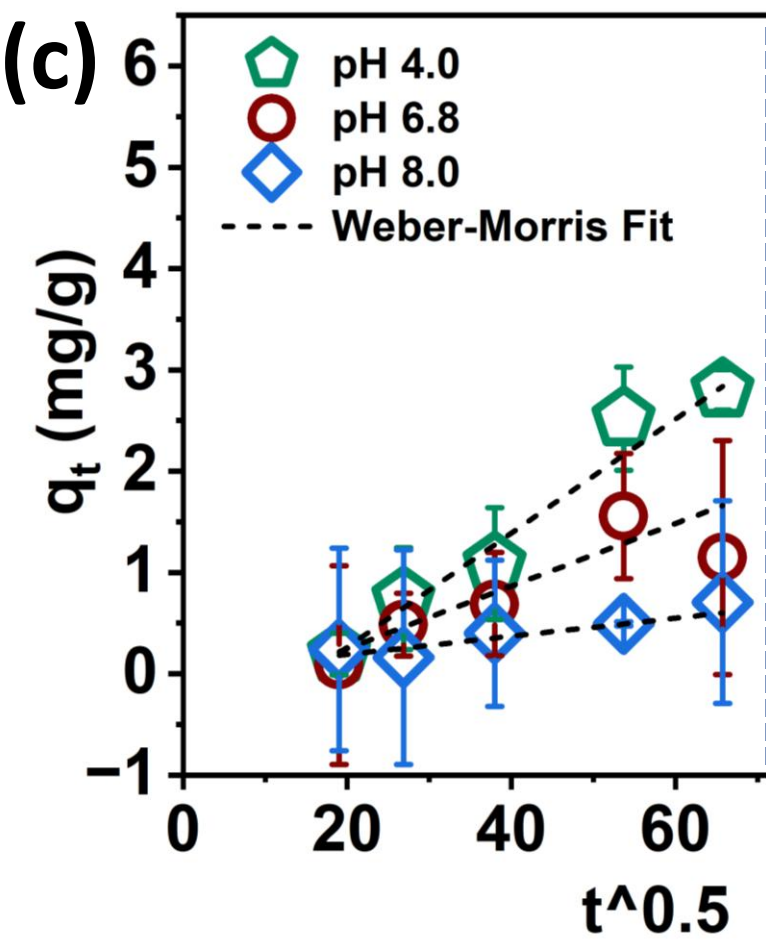
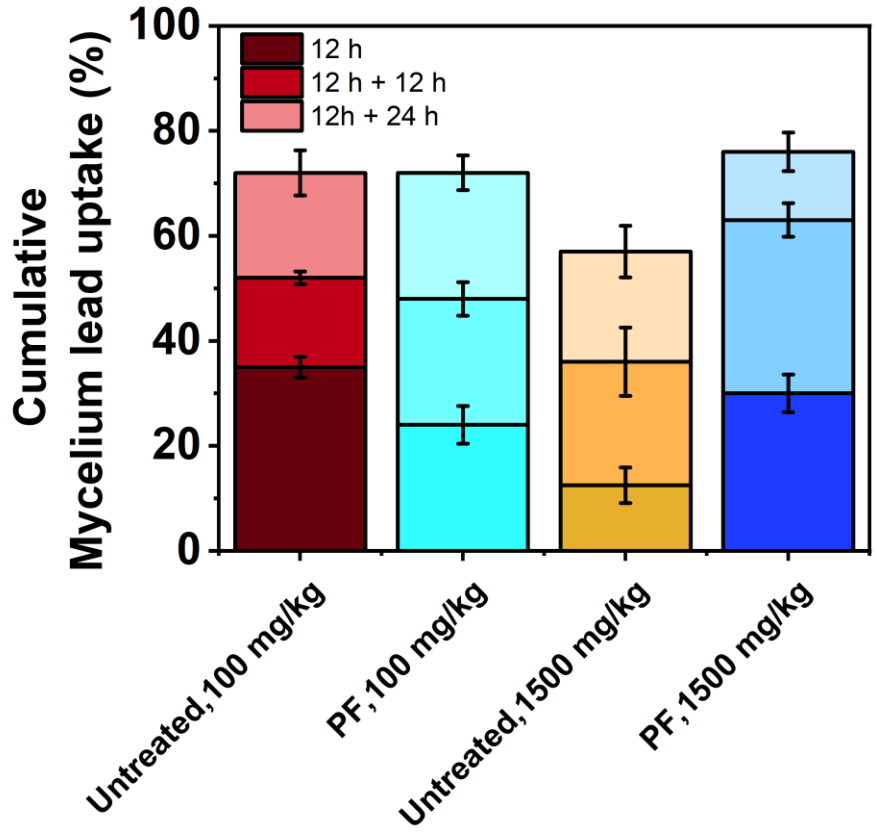

(c)
pH 4.0
pH 6.8
pH 8.0
Weber-Morris Fit
q_t (mg/g)
−1
0
1
2
3
4
5
6
0
20
40
60
t^0.5

Figure 8



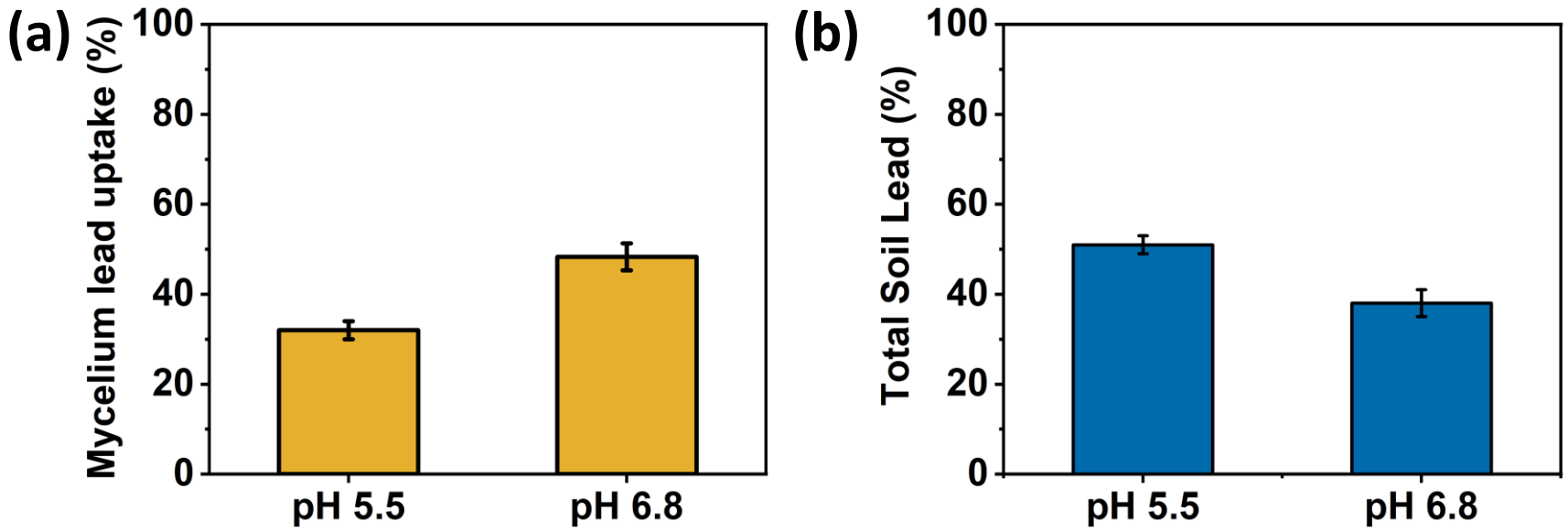
60%→72% 32% → 70% 25 % → 55% 10% → 75%

	Concentrations (mg/kg), pH	Calculated Q_e (mg/g)	k_t (mg/g min)	R^2
Untreated	100, pH 6.8	0.24	4.00×10^{-3}	0.94
Untreated	1500, pH 6.8	1.73	2.34×10^{-4}	0.86
PF-mycelium	100, pH 4	0.30	1.44×10^{-3}	0.91
PF-mycelium	100, pH 6.8	0.35	6.61×10^{-4}	0.90
PF-mycelium	100, pH 8	0.15	2.94×10^{-3}	0.75
PF-mycelium	1500, pH 4	4.94	5.84×10^{-5}	0.95
PF-mycelium	1500, pH 6.8	4.44	4.54×10^{-5}	0.61
PF-mycelium	1500, pH 8	3.54	4.2×10^{-5}	0.8

	Calculated Q_e (mg/g)	k_t (mg/g min)	R^2	Experimental equilibrium mass (mg/g)
As-received 100 mg/kg	0.24	4.00×10^{-3}	0.94	0.22
As-received 1500 mg/kg	1.73	2.34×10^{-4}	0.86	1.43
PF-mycelium 100 mg/kg, pH 4	0.30	1.44×10^{-3}	0.91	0.22
PF-mycelium 100 mg/kg, pH 6.8	0.35	6.61×10^{-4}	0.90	0.25
PF-mycelium 100 mg/kg, pH 8	0.15	2.94×10^{-1}	0.75	0.15
PF-mycelium 1500 mg/kg, pH 4	4.94	5.84×10^{-5}	0.95	3.49
PF-mycelium 1500 mg/kg, pH 6.8	4.44	4.54×10^{-5}	0.61	2.50
PF-mycelium 1500 mg/kg, pH 8	20.00	0.91×10^{-5}	0.78	3.50

Supplementary Information

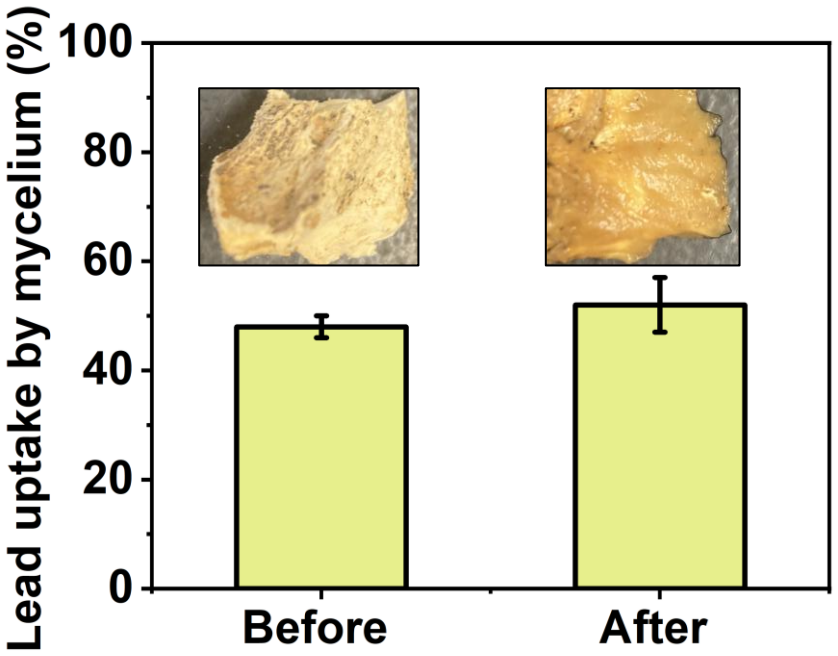
Figure S1


(a)
Mycelium lead uptake (%)
100
80
60
40
20
0
pH 5.5
pH 6.8
(b)
Total Soil Lead (%)
100
80
60
40
20
0
pH 5.5
pH 6.8

Supplementary

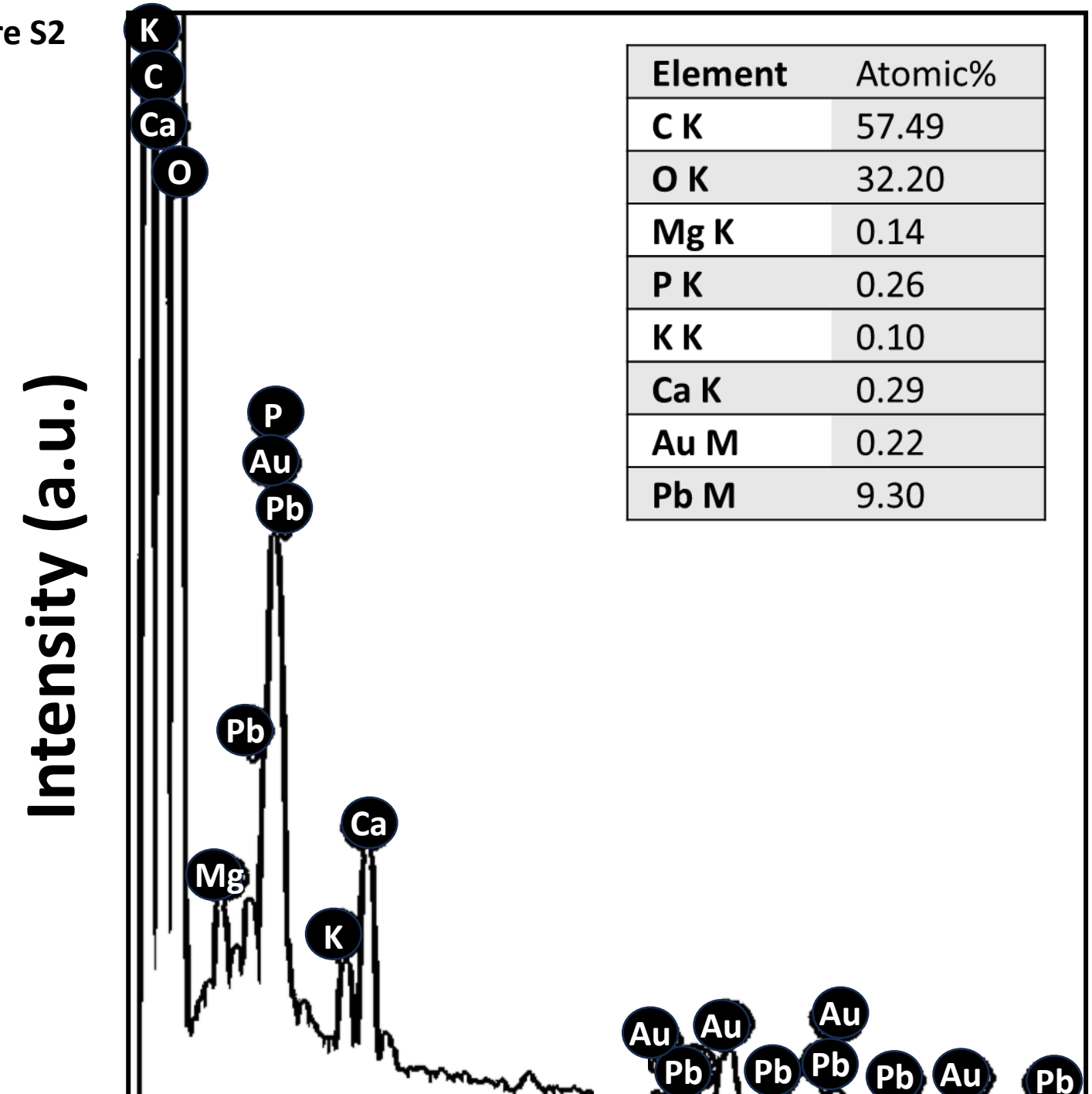
Element	Atomic%
C K	57.49
O K	32.20
Mg K	0.14
P K	0.26
K K	0.10
Ca K	0.29
Au M	0.22
Pb M	9.30

Reference for lead-free mycelium (cm^{-1})	*Reference for lead adsorbed mycelium (cm^{-1})*
1377 [1]	1376 [1]
1544 [2]	1541 [2]
1643 [2] 1638 [1]	1644 [2] 1626 [1]
3269 [2] 3262 [3]	3273 [2] 3270 [3]



(a) Spectrum Pb- adsorbed 20 days

Figure S2



Element	Atomic%
C K	57.49
O K	32.20
Mg K	0.14
P K	0.26
K K	0.10
Ca K	0.29
Au M	0.22
Pb M	9.30

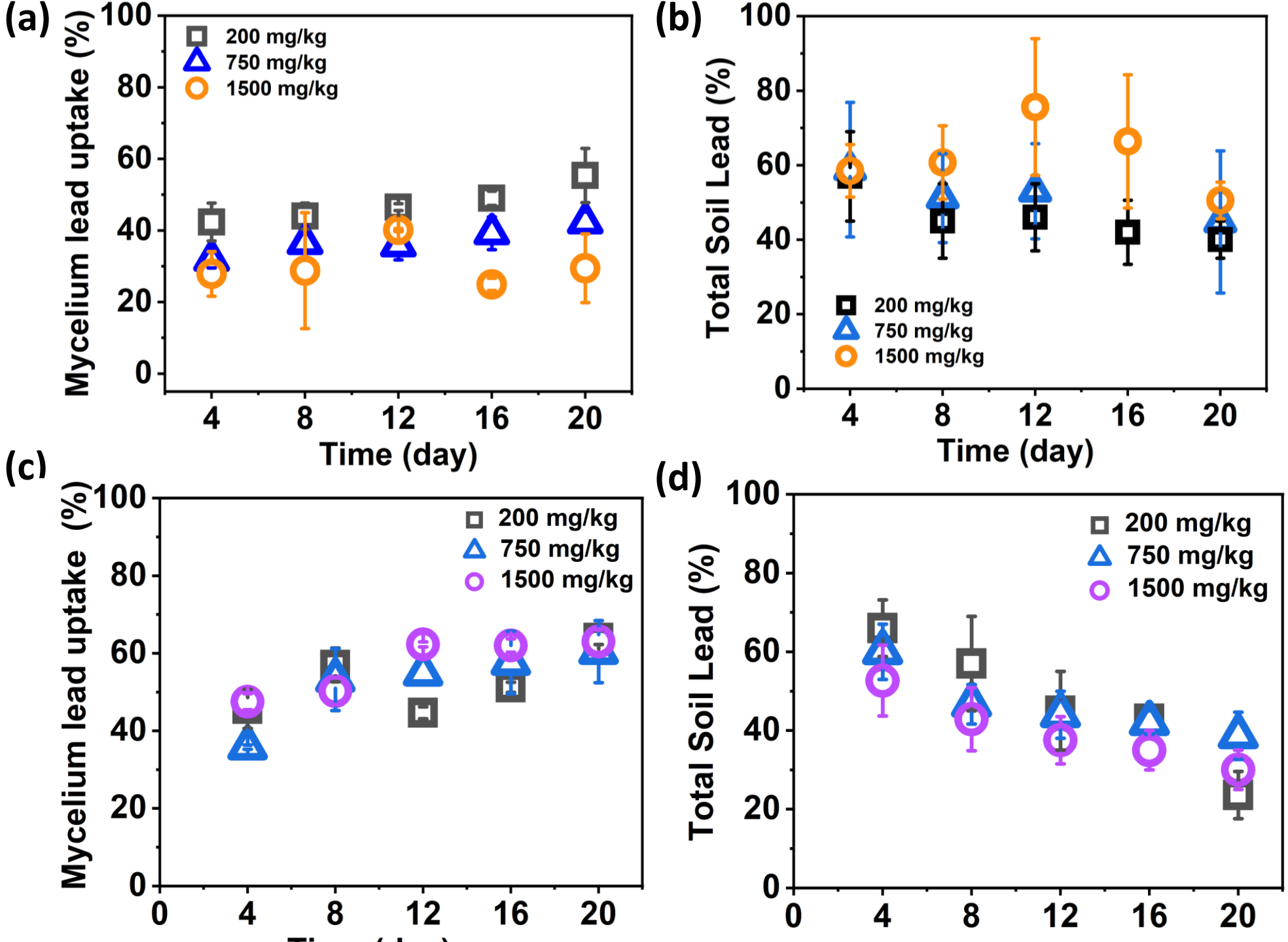
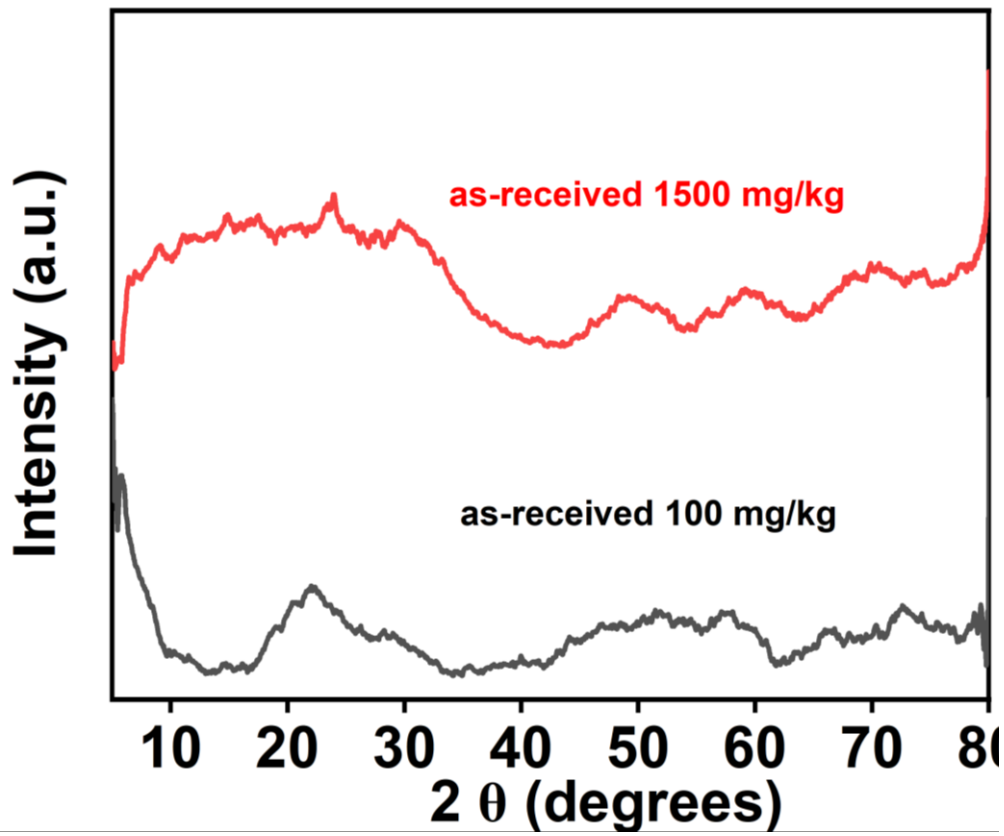
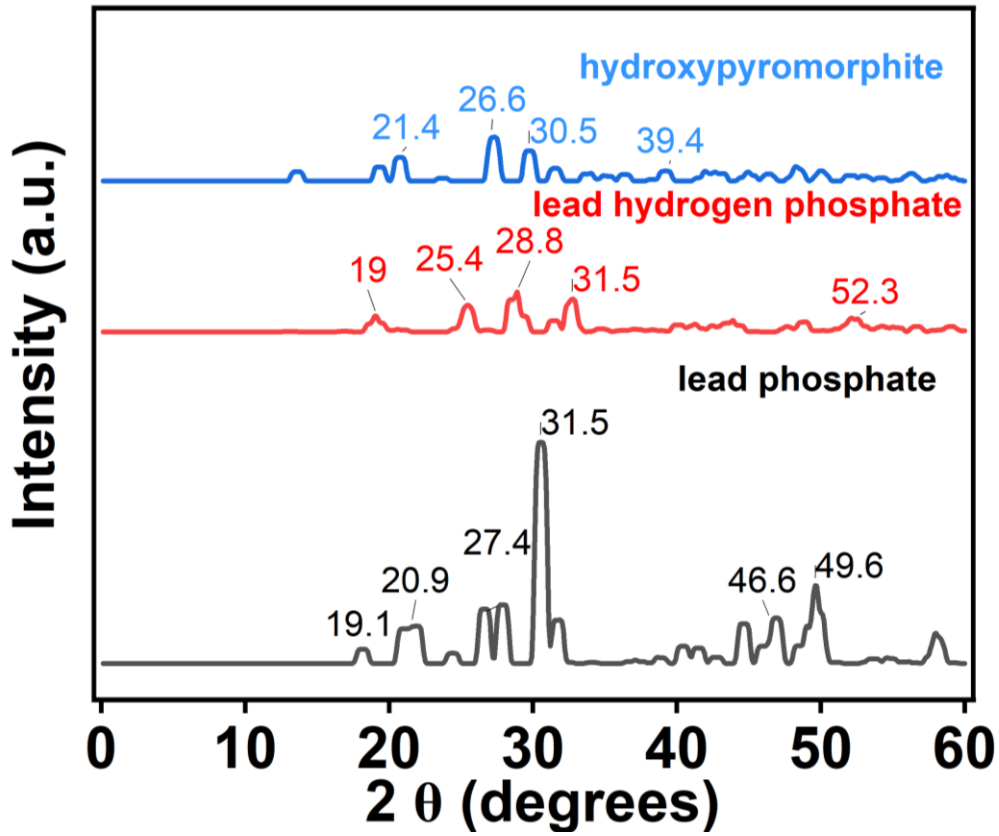
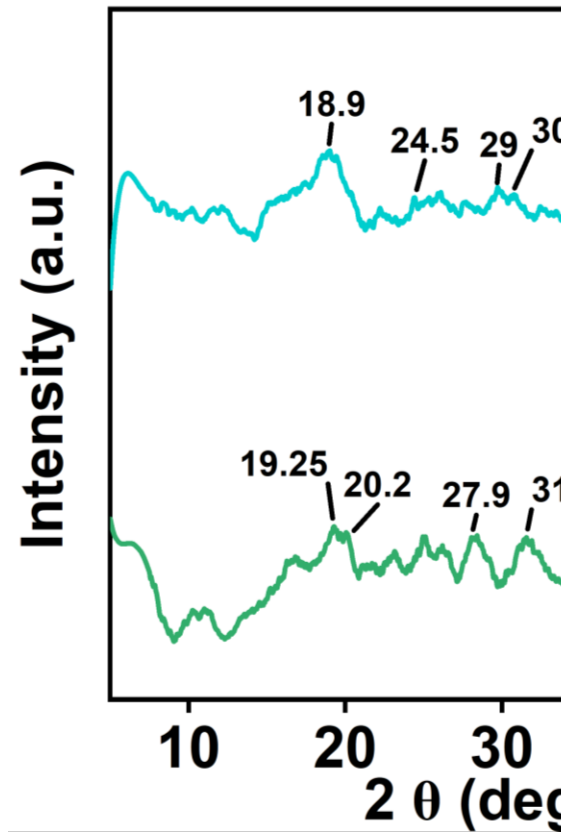

(a)
Mycelium lead uptake (%)
100
80
60
40
20
0
200 mg/kg
750 mg/kg
1500 mg/kg
4
8
12
16
20
Time (day)
(b)
Total Soil Lead (%)
100
80
60
40
20
0
200 mg/kg
750 mg/kg
1500 mg/kg
4
8
12
16
20
Time (day)
(c)
Mycelium lead uptake (%)
100
80
60
40
20
0
200 mg/kg
750 mg/kg
1500 mg/kg
0
4
8
12
16
20
(d)
Total Soil Lead (%)
100
80
60
40
20
0
200 mg/kg
750 mg/kg
1500 mg/kg
0
4
8
12
16
20

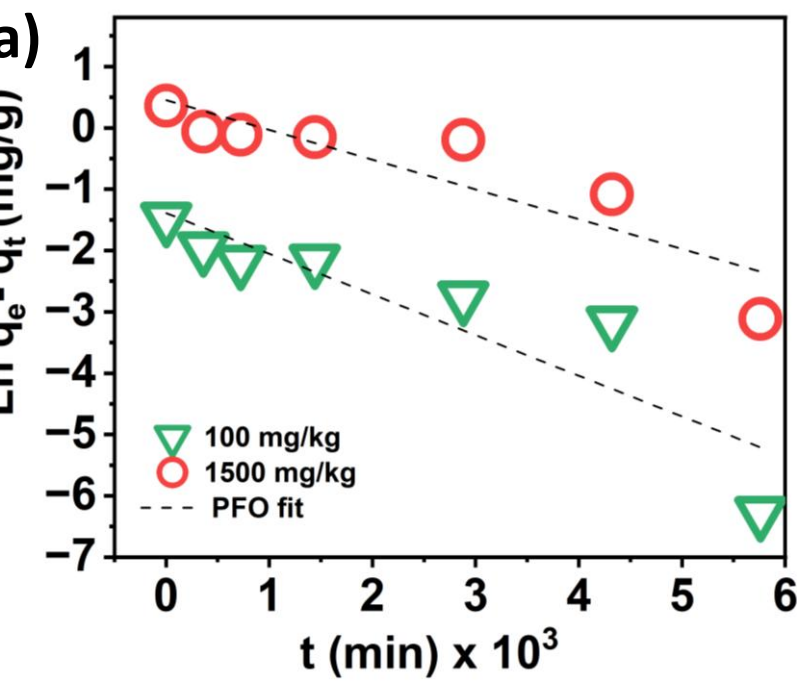
Figure S4

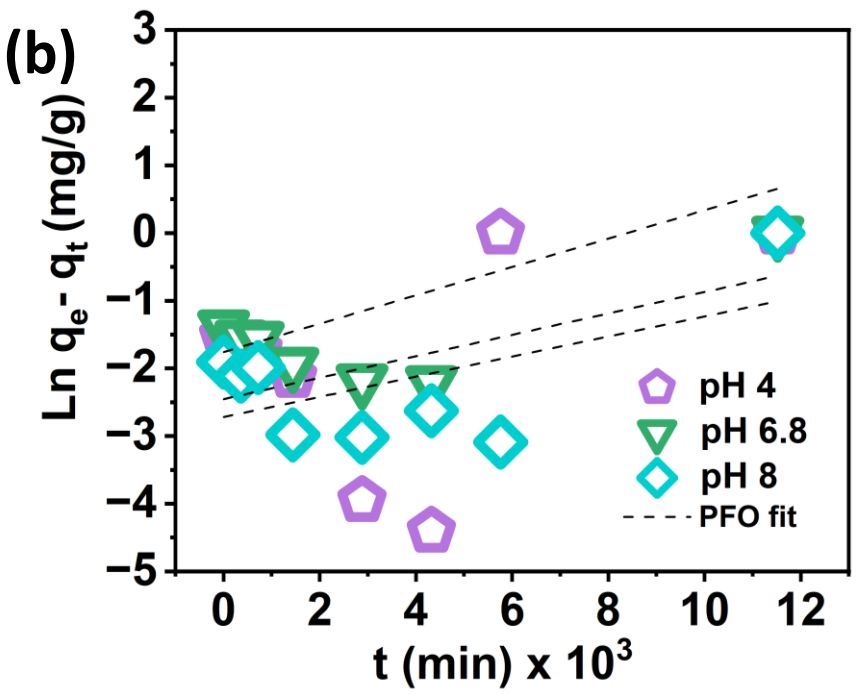

Intensity (a.u.)
as-received 1500 mg/kg
as-received 100 mg/kg
10 20 30 40 50 60 70 8
2 θ (degrees)

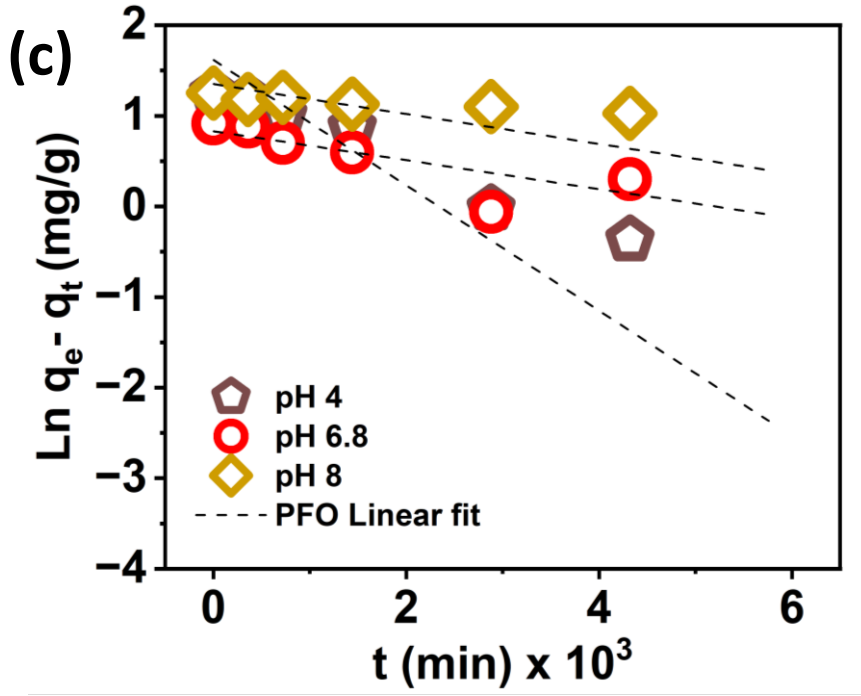

Intensity (a.u.)
hydroxypyromorphite
21.4
26.6
30.5
39.4
lead hydrogen phosphate
19
25.4
28.8
31.5
52.3
lead phosphate
31.5
27.4
20.9
19.1
46.6
49.6
0 10 20 30 40 50 60
2 θ (degrees)


Intensity (a.u.)
18.9
24.5
29
19.25
20.2
27.9
10 20 30
2 θ (deg

Reference peak assignment			Peaks assignment for spectra in this study 100 mg/kg	
Lead phosphate	**Lead hydrogen phosphate**	**Hydroxy Pyromorphite**	**pH 6.8 24 h**	**pH 8 1 h**
19.10	19.00	21.40	19.25	18.90
20.80	25.60	26.80	20.2	24.50
27.00	26.80	30.30	27.9	29.00
29.70	32.50		31.55	30.60
46.6			45.60	41.10
49.6	52.3		49.00	52.65


a)
Ln q_e- q_t (mg/g)
t (min) x 10^3
100 mg/kg
1500 mg/kg
PFO fit


(b)
Ln q_e- q_t (mg/g)
t (min) x 10^3
pH 4
pH 6.8
pH 8
PFO fit


(c)
Ln q_e- q_t (mg/g)
t (min) x 10^3
pH 4
pH 6.8
pH 8
PFO Linear fit