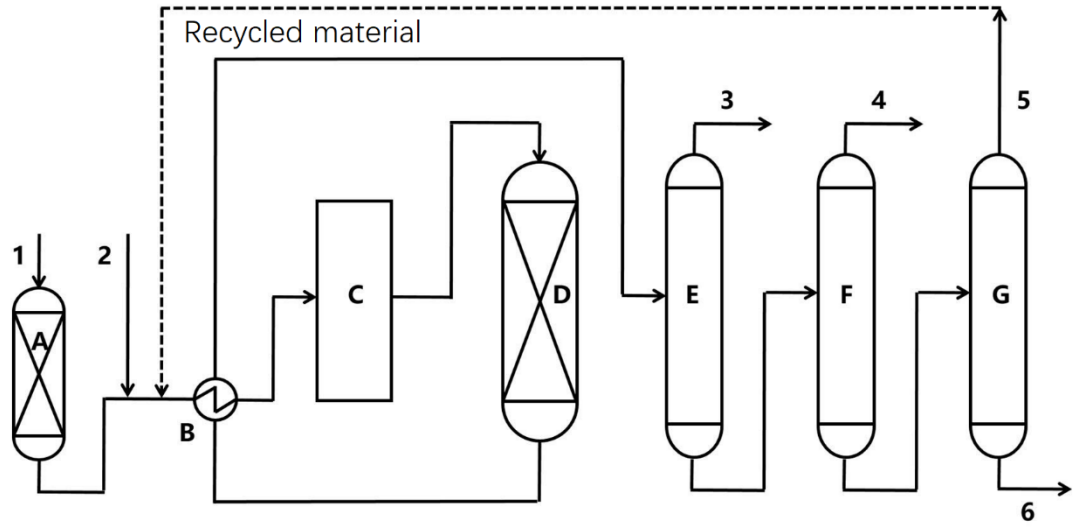

Recycled material
1
2
A
B
C
D
E
F
G
3
4
5
6

Fig. 1

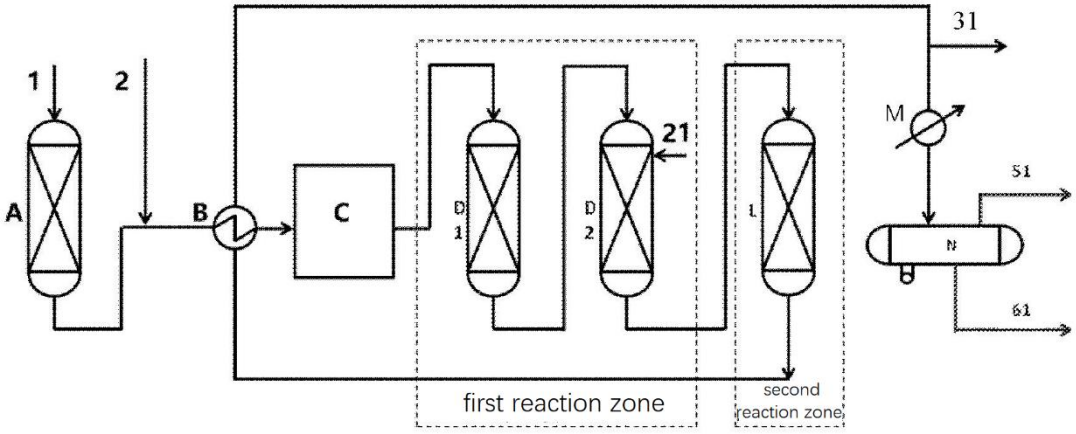

1
2
A
B
C
D1
D2
21
L
M
N
31
51
61
first reaction zone
second reaction zone

Fig. 2

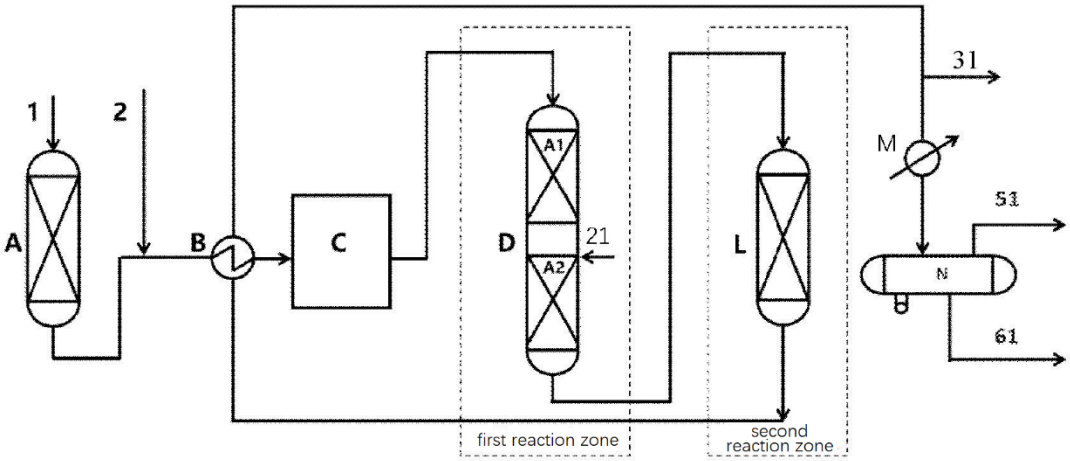

1
2
A
B
C
D
A1
A2
21
L
M
31
51
N
61
first reaction zone
second
reaction zone

Fig. 3

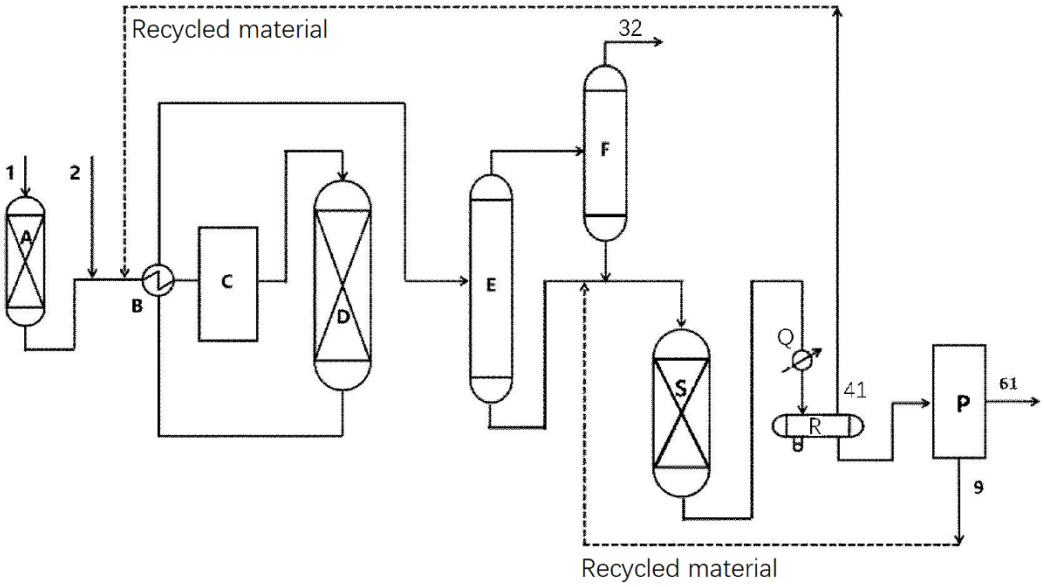

Recycled material
32
1
2
A
B
C
D
E
F
S
Q
R
41
P
61
9
Recycled material

Fig. 4

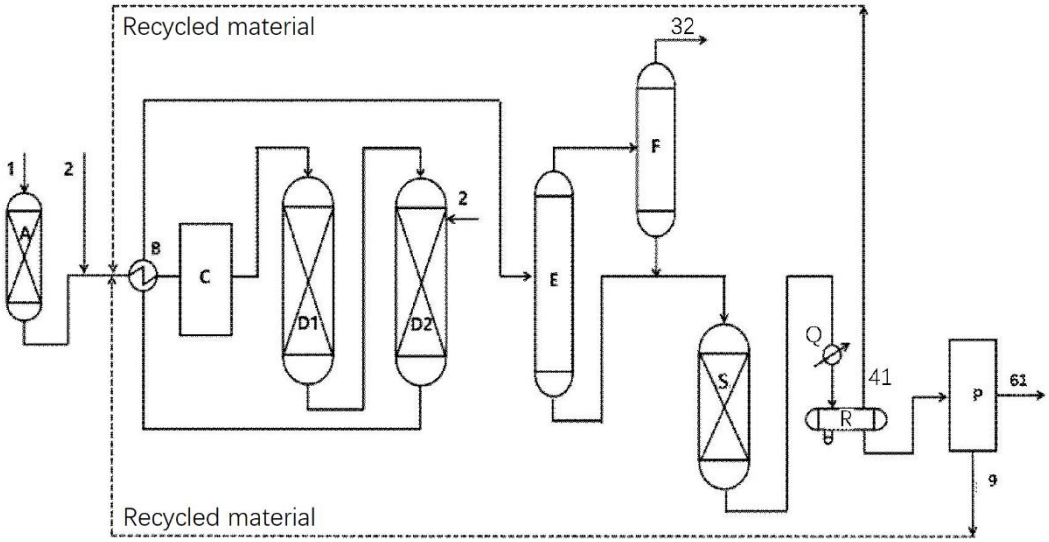

Recycled material
32
1
2
A
B
C
D1
D2
2
E
F
S
Q
41
R
P
61
9
Recycled material

Fig. 5

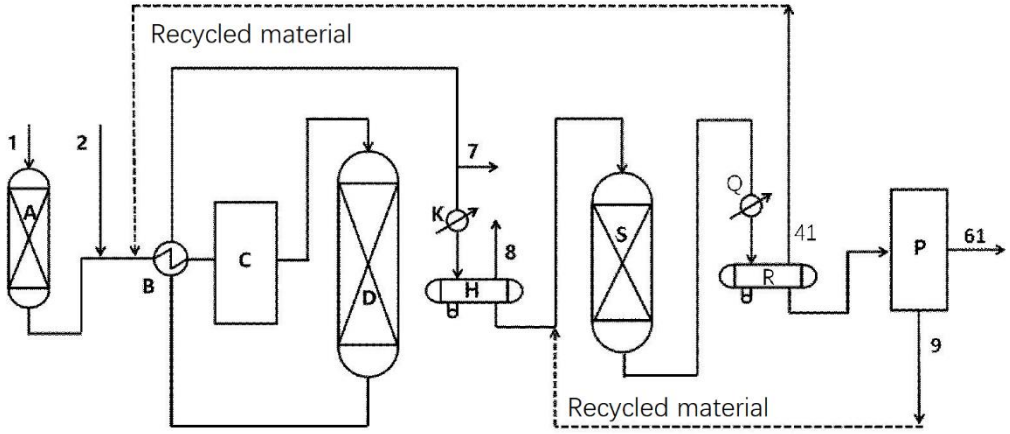

Recycled material
1
2
A
B
C
D
7
K
8
H
S
Q
41
R
P
61
9
Recycled material

Fig. 6

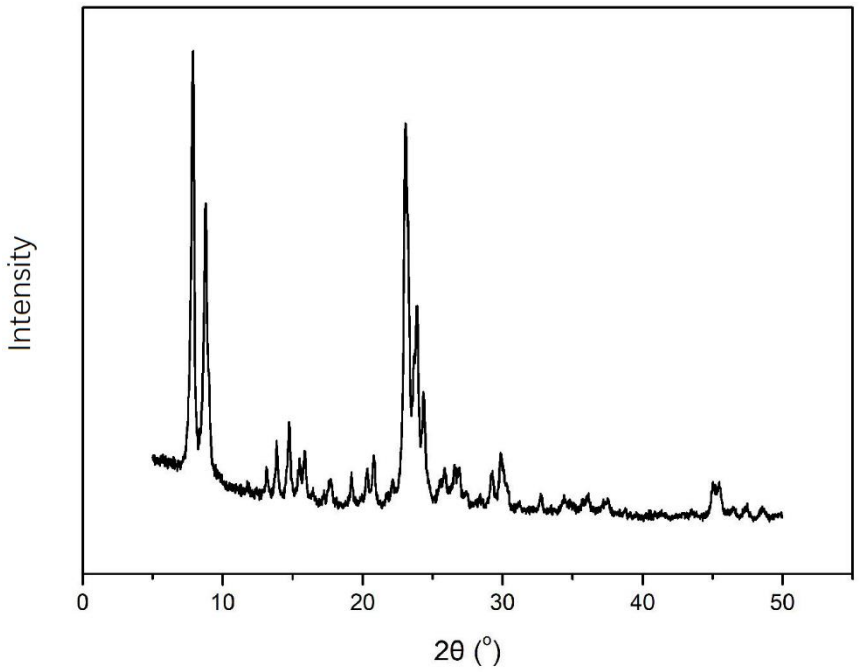


Fig. 7

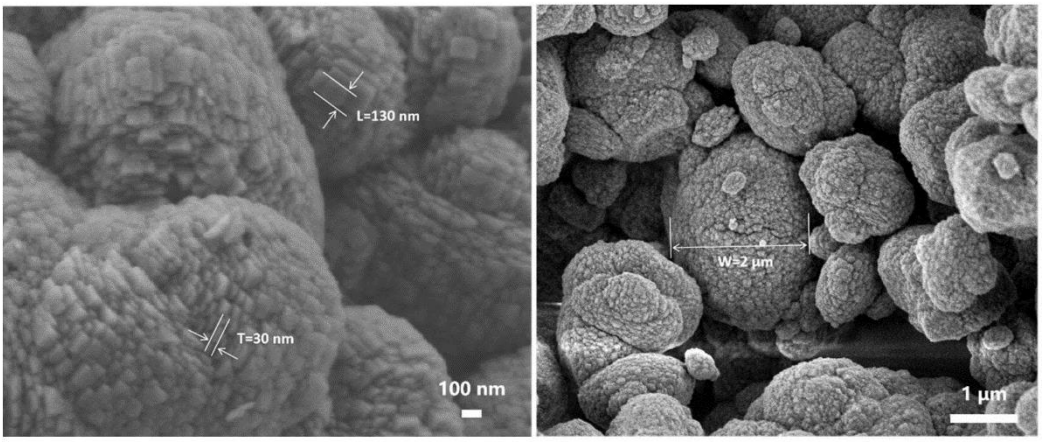


Fig. 8

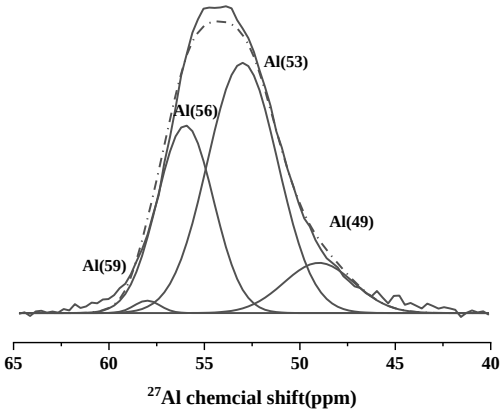

Al(53)
Al(56)
Al(49)
Al(59)
65
60
55
50
45
40
27Al chemcial shift(ppm)

Fig. 9

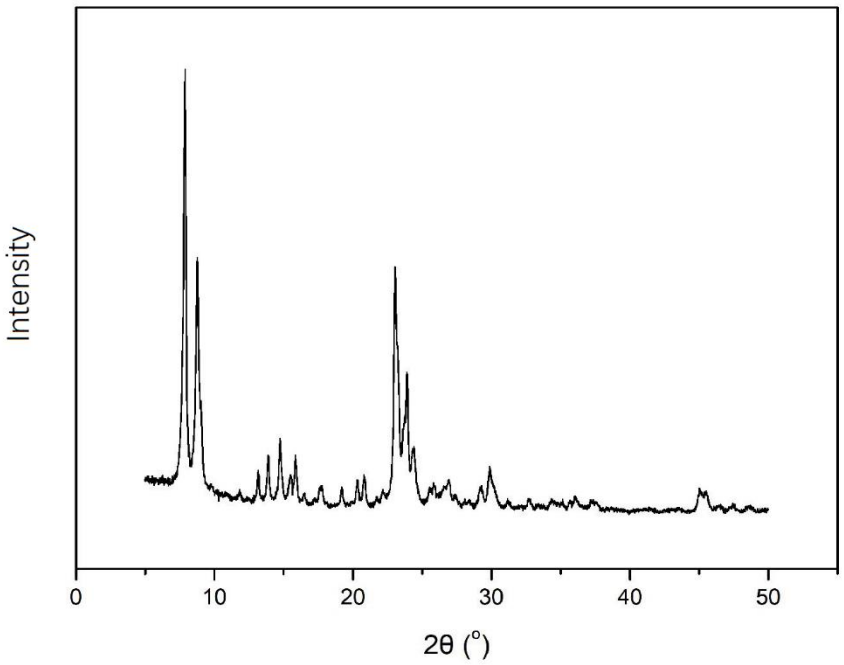

Intensity
0
10
20
30
40
50
2θ (°)

Fig. 10

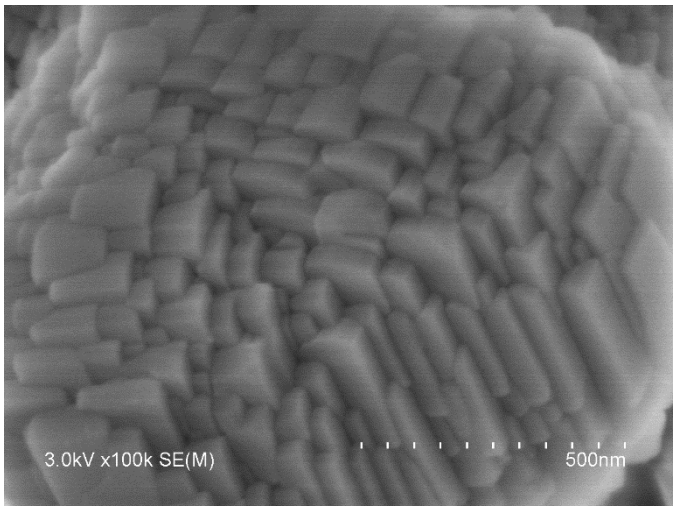


Fig. 11

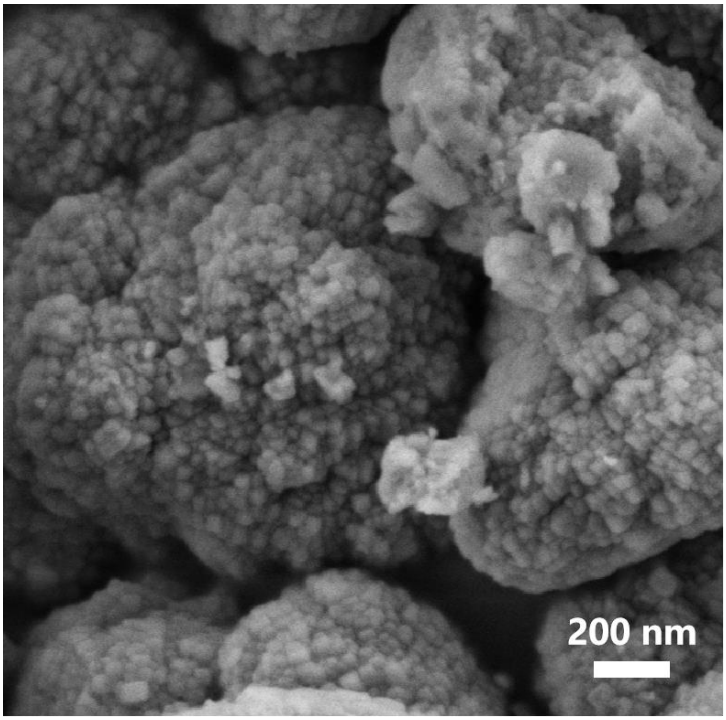


Fig. 12

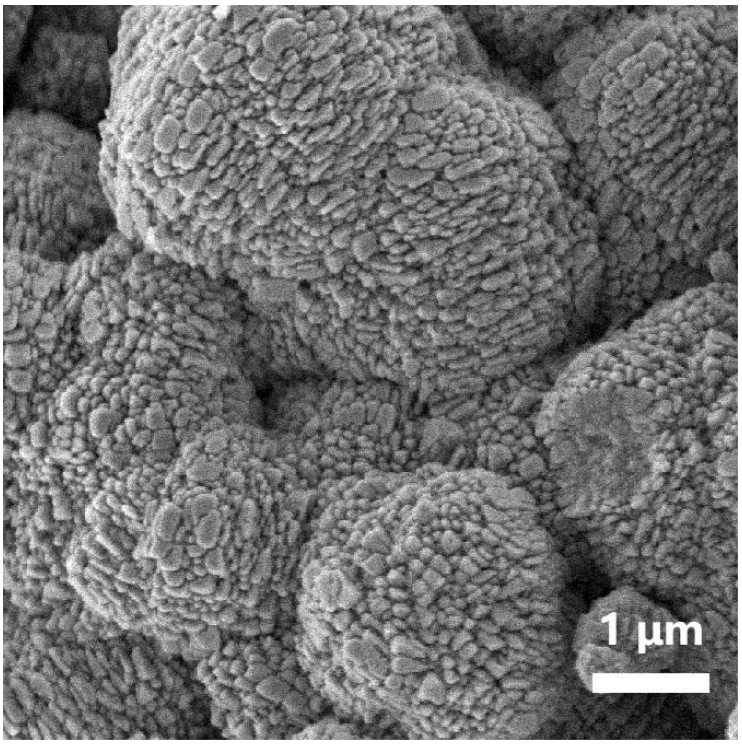


Fig. 13

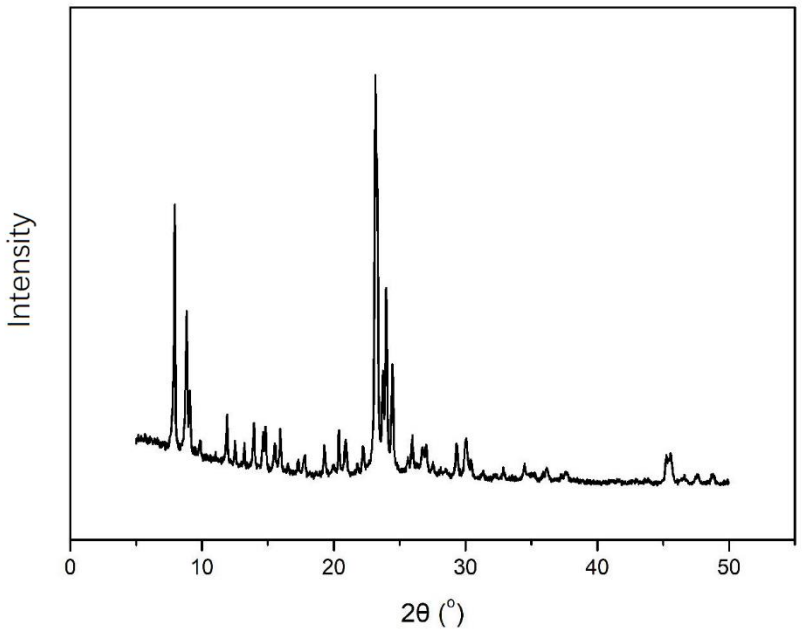


Fig. 14

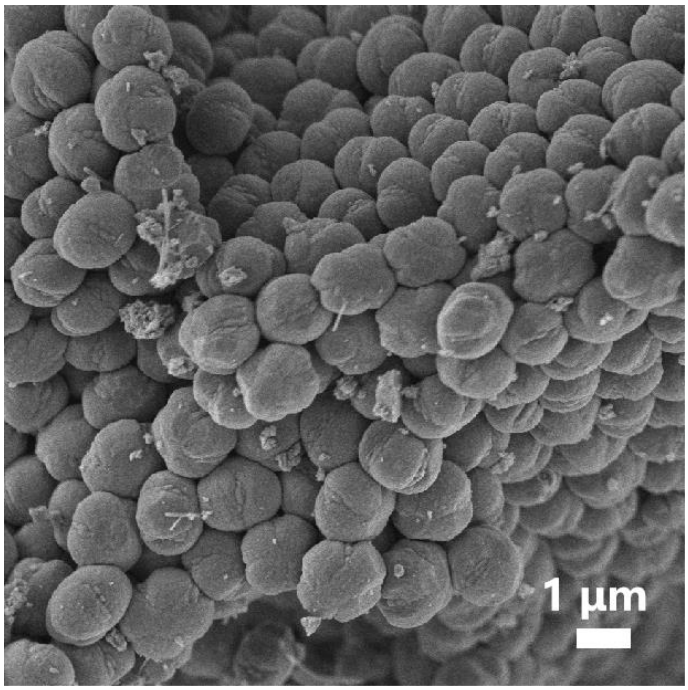


Fig. 15

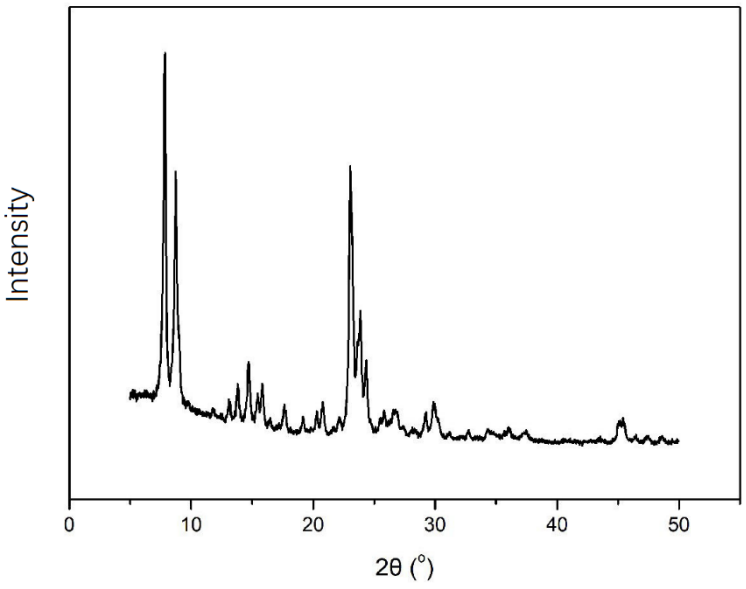


Fig. 16

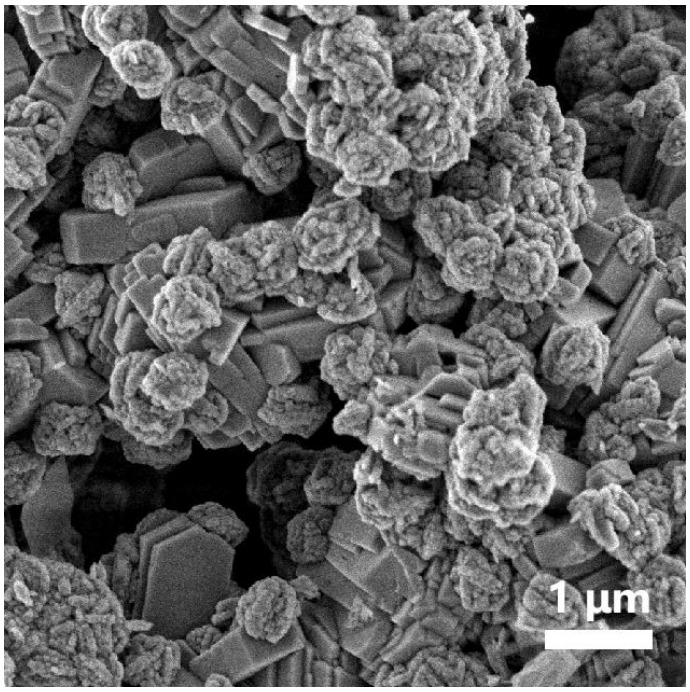


Fig. 17

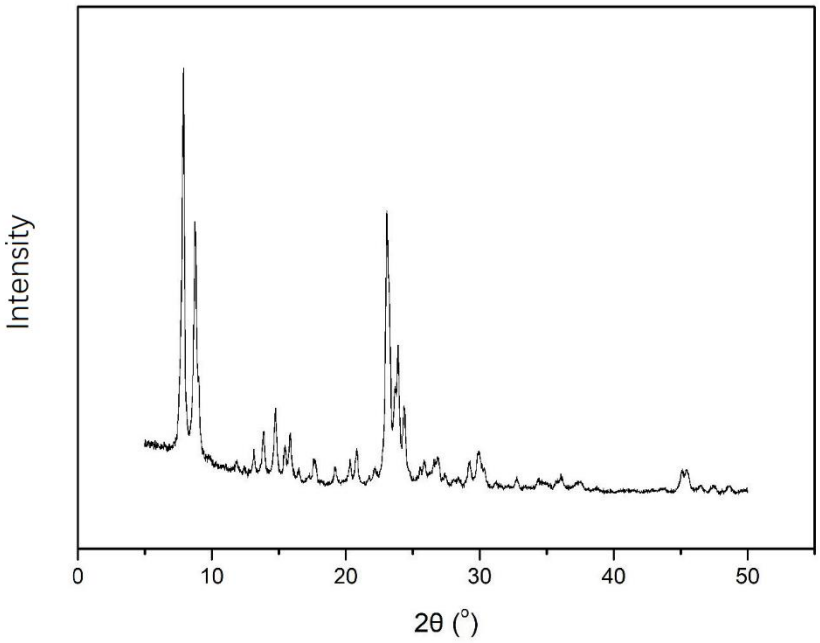


Fig. 18

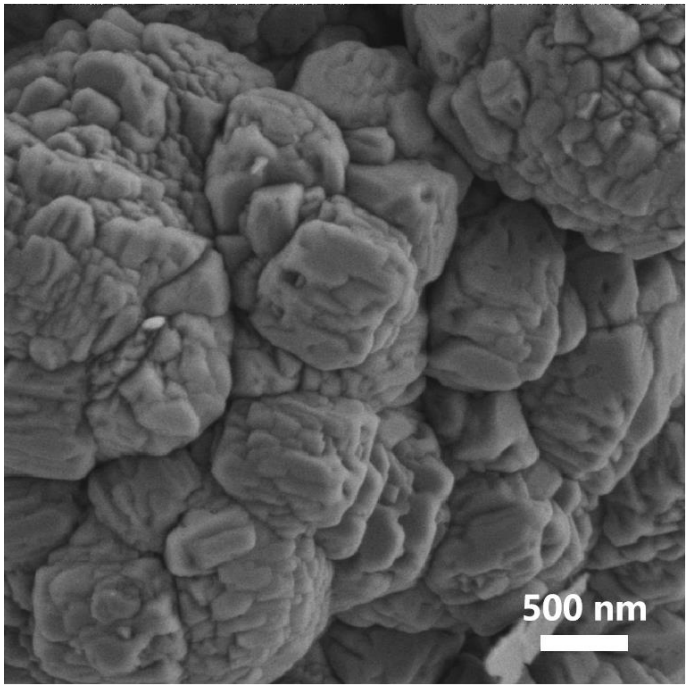


Fig. 19

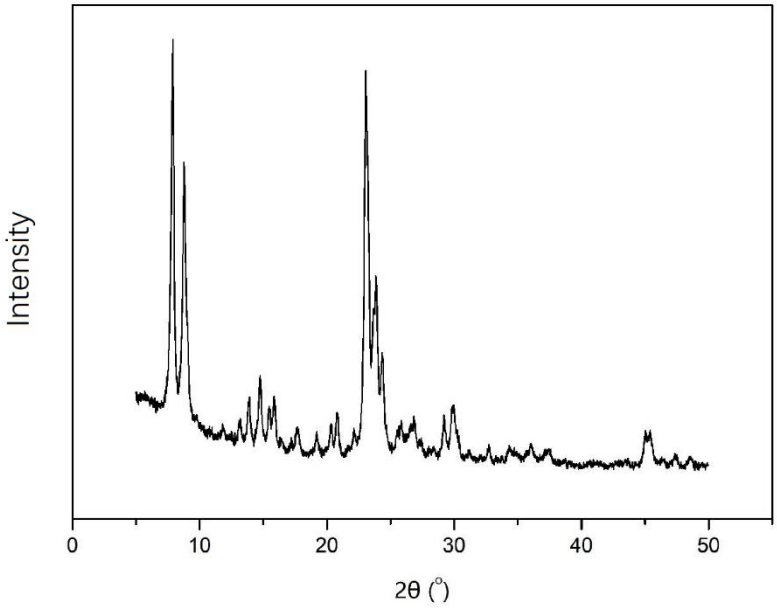


Fig. 20

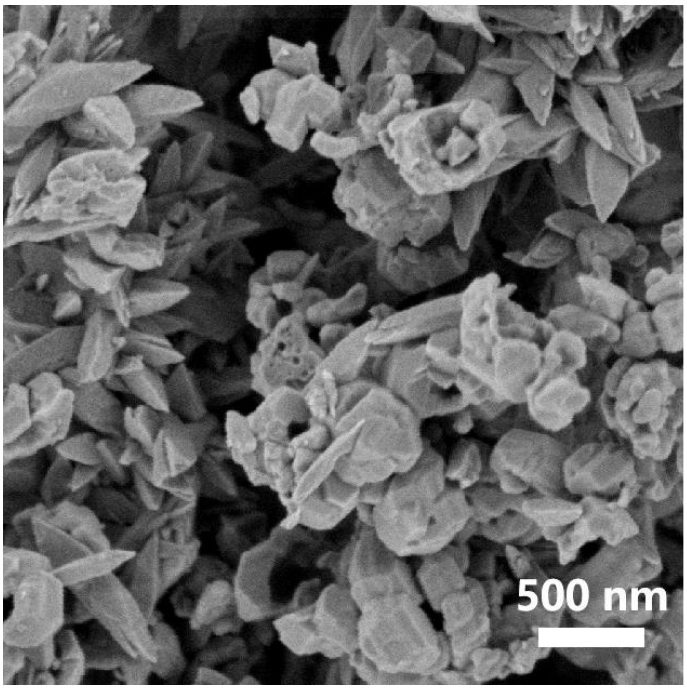


Fig. 21

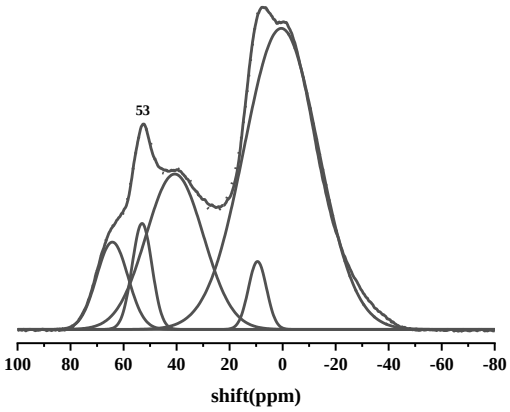


Fig. 22