Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Passion fruit-like microspheres of FeS_2 wrapped with carbon as excellent fast charging materials for supercapacitors

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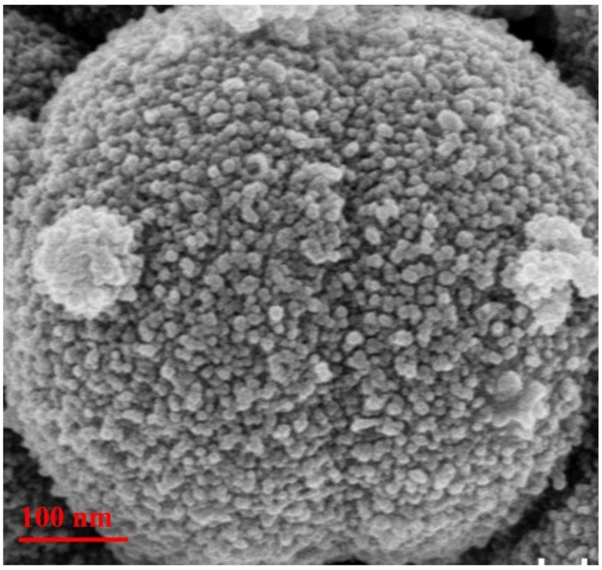

Fig. S1 SEM image of FeS_2@Carbon-3 microspheres.

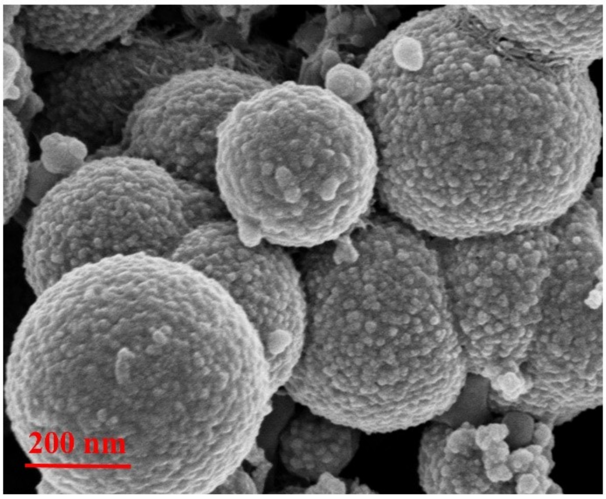

Fig. S2 SEM image of FeS_2@Carbon-0 microspheres.

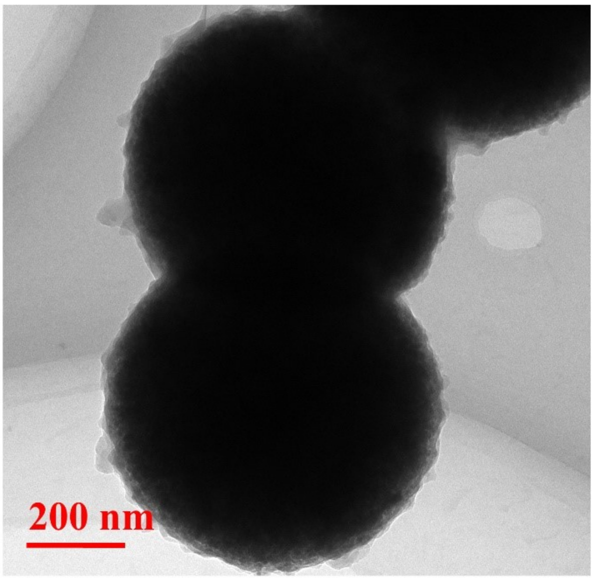

Fig. S3 TEM image of FeS_2@Carbon-0 microspheres.

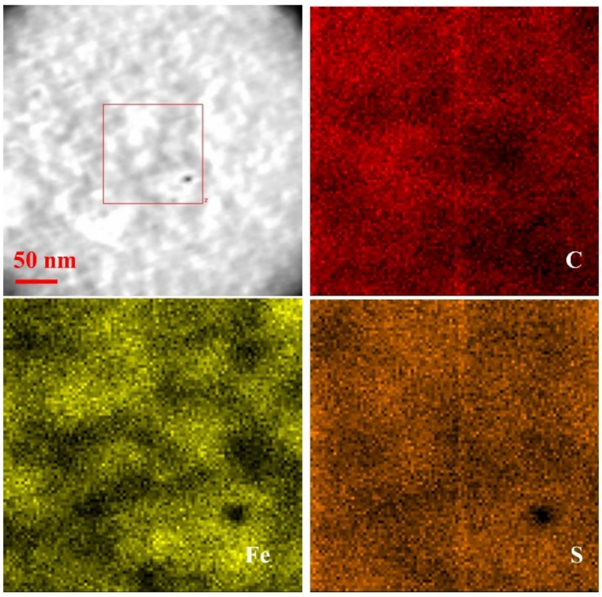

Fig. S4 Elemental mapping images of FeS_2@Carbon-3 microspheres.

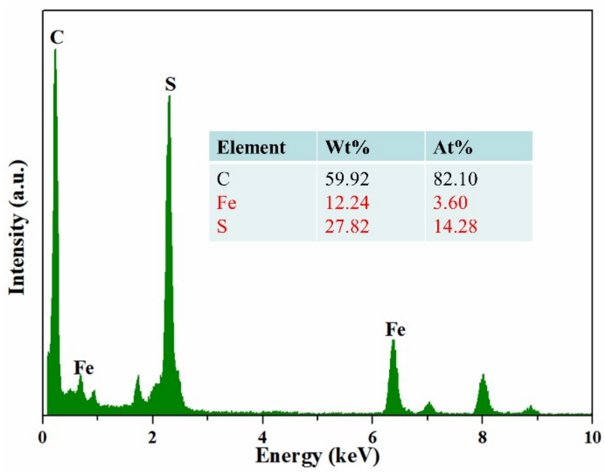

Fig. S5 EDX spectrum of FeS_2@Carbon-3 microspheres.

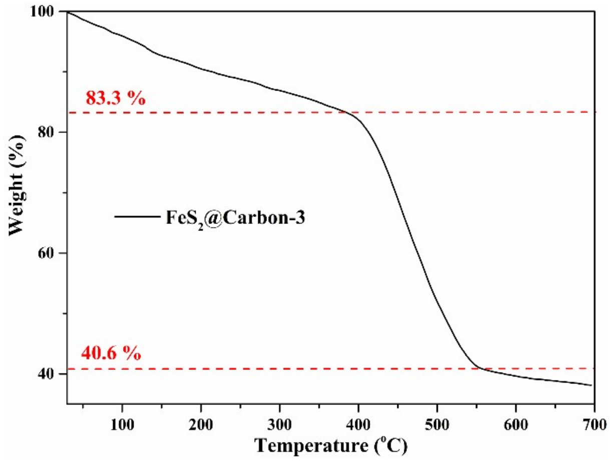

Fig. S6 TGA of FeS_2@Carbon-3 microspheres.

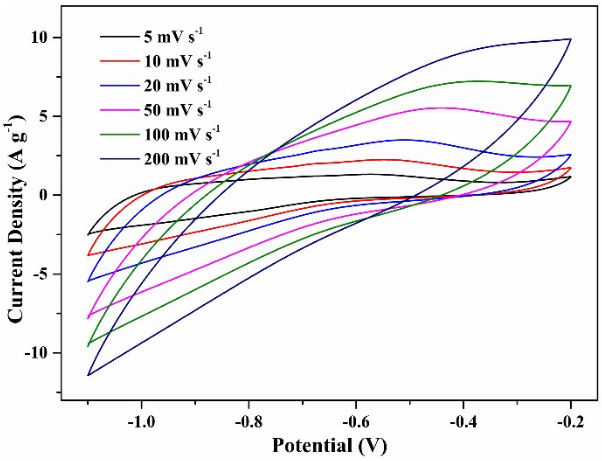

Fig. S7 CV curves of FeS_2 at different scan rates.

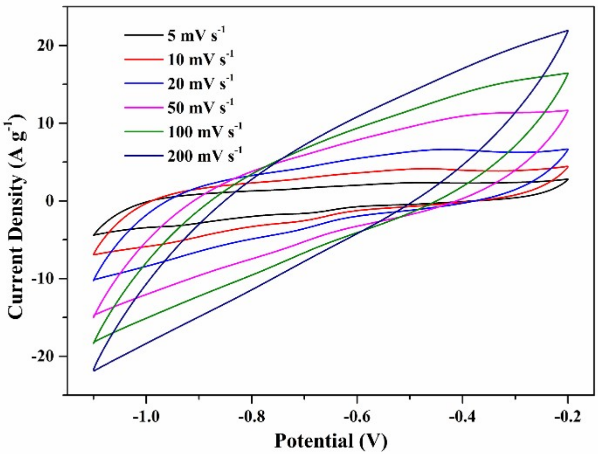

Fig. S8 CV curves of the FeS_2@Carbon-0 microspheres at different scan rates.

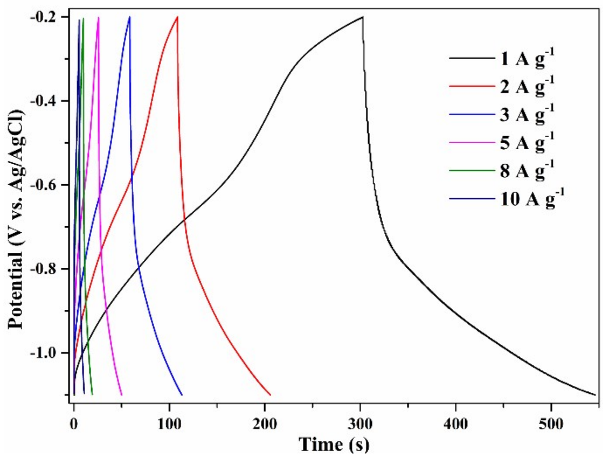

Fig. S9 Galvanostatic charge-discharge curves of FeS_2 microspheres at different current densities.

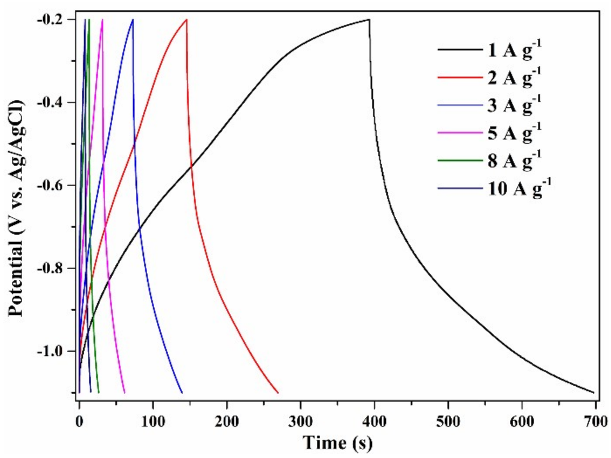

Fig. S10 Galvanostatic charge-discharge curves of FeS_2@Carbon-0 microspheres at different current densities.

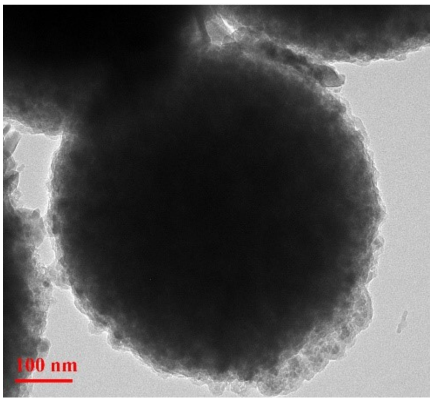

Fig. S11 TEM image of FeS_2@Carbon-3 microspheres after cycling test.

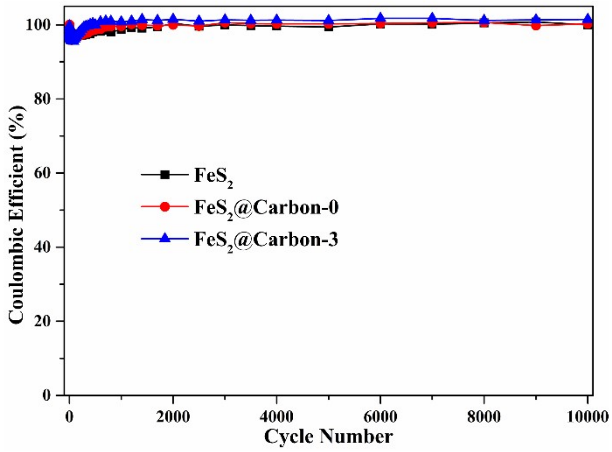

Fig. S12 The coulombic efficiency of FeS_2, FeS_2@Carbon-0 and FeS_2@Carbon-3 microspheres at the current density of 5 A g^{-1} associated to the galvanostatic charge-discharge cycles.

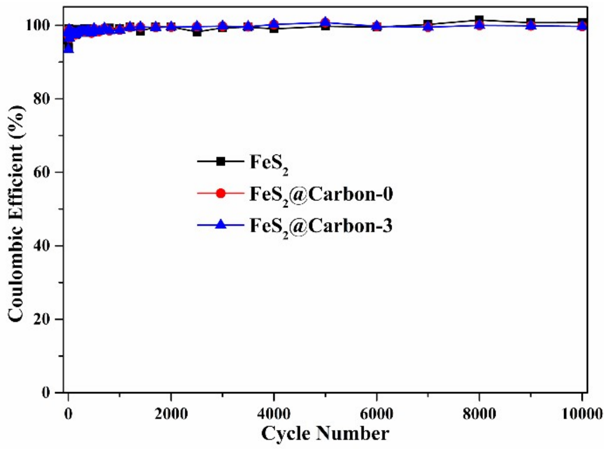

Fig. S13 The coulombic efficiency of FeS_2, FeS_2@Carbon-0 and FeS_2@Carbon-3 microspheres at the current density of 8 A g^{-1} associated to the galvanostatic charge-discharge cycles.

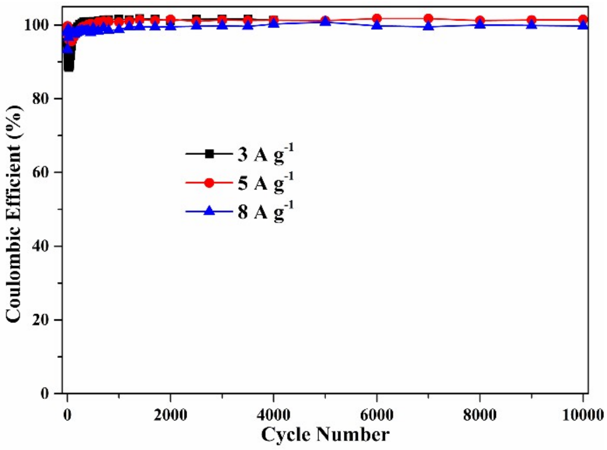

Fig. S14 The coulombic efficiency of FeS_2@Carbon-3 microspheres at different current densities of 3, 5 and 8 A g^{-1} associated to the galvanostatic charge-discharge cycles.

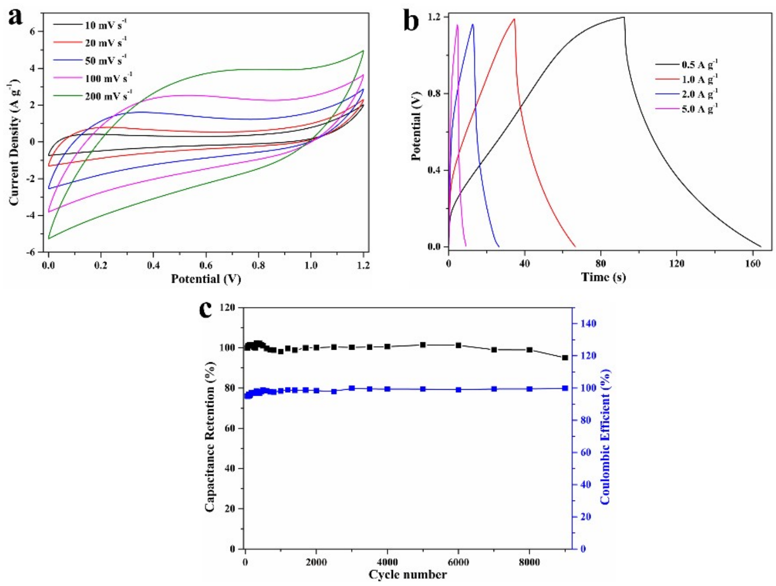

Fig. S15 (a) CV at different scan rates, (b) GCD curves at different current densities and (c) Long cycle performance of the HSC.

Table S1 The specific capacitance of FeS_2, FeS_2@Carbon-0 and FeS_2@Carbon-3 microspheres at different scan rates.

Scan rates (mV s^{-1})	Specific capacitance (F g^{-1})		
	FeS_2	FeS_2@Carbon-0	FeS_2@Carbon-3
5	285.5	542.7	470.6
10	231.4	457.3	427.6
20	162.7	328.3	330.6
50	90.3	180.8	197.9
100	50.1	103.9	122.0
200	29.3	56.1	70.1

Table S2 The specific capacitance of FeS_2, FeS_2@Carbon-0 and FeS_2@Carbon-3 microspheres at different current densities.

Current density (A g^{-1})	Specific capacitance (F g^{-1})		
	FeS_2	FeS_2@Carbon-0	FeS_2@Carbon-3
1	270.0	337.8	278.4
2	216.0	274.7	242.2
3	181.3	221.0	208.7
5	134.4	165.6	171.7
8	82.7	112.9	126.2
10	58.9	83.3	100.0

Table S3 Comparison the specific capacitance with some reported literature on FeS_2 composites for supercapacitors.

Materials	Electrolyte	Specific capacitance	Current density	Ref
FeS_2 nano-alloys	30% KOH	406 F g^{-1}	1 A g^{-1}	1
FeS_2@Fe_2O_3 hybrid	1M Li_2SO_4	255 F g^{-1}	1 A g^{-1}	2
FeS_2 nanobelts	1M Na_2SO_4	317.9 F g^{-1}	3 A g^{-1}	3
FeS_2/GNS	2M KOH	793 C g^{-1}	3 A g^{-1}	4
FeS_2 nanoellipsoids	2M KOH	515 C g^{-1}	1 A g^{-1}	5
FeS_2/graphene aerogel	6M KOH	268.7 F g^{-1}	2 A g^{-1}	6
FeS_2/Fe_2O_3@S-rGO	6M KOH	790 F g-1	2 A g^{-1}	**7**
P-FeS_2/GNS	2M KOH	246 mAh g^{-1}	3 A g^{-1}	8
FeS_2 nanotubes	3M KCl	320 F g^{-1}	1.25 A g^{-1}	9
FeS_2/MoS_2 nanosheet	3M KOH	495 mF cm^{-2}	1 mA cm^{-2}	10
FeS_2/PVP composite	3M KOH	526.08 F g^{-1}	1 A g^{-1}	11
FeS_2/3DPC	1M KOH	304 F g^{-1}	2 A g^{-1}	12
Pyrite FeS_2	3.5M KOH	206 F g^{-1}	1 A g^{-1}	13
Petal-like FeS_2	6M KOH	321.3 F g-1	1 A g^{-1}	15
FeS_2@Carbon-3	1M KOH	278.4 F g^{-1}	1 A g^{-1}	**This work**

Supporting References

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