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Supporting Information

Core-shell GaP@C nanoparticles with thin and uniform carbon coating as a promising anode material for rechargeable lithium-ion batteries

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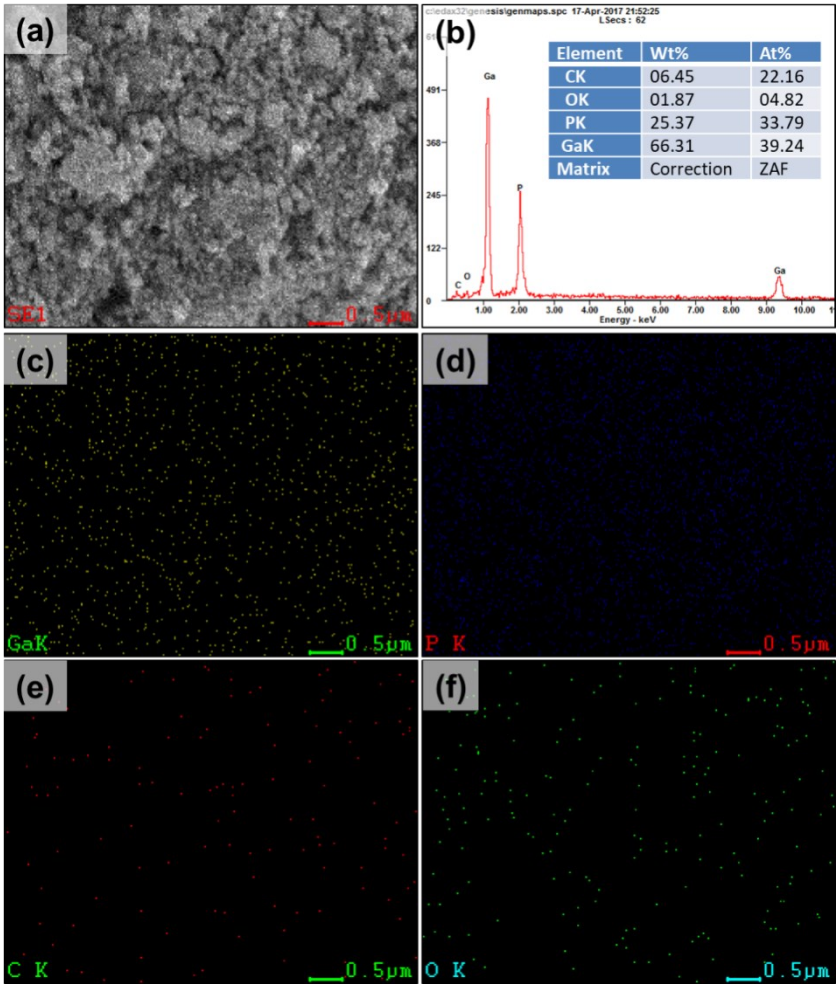

Figure S1 (a) SEM image of GaP@C, (b) EDX result and (c-f) elemental mapping of GaP@C composite.

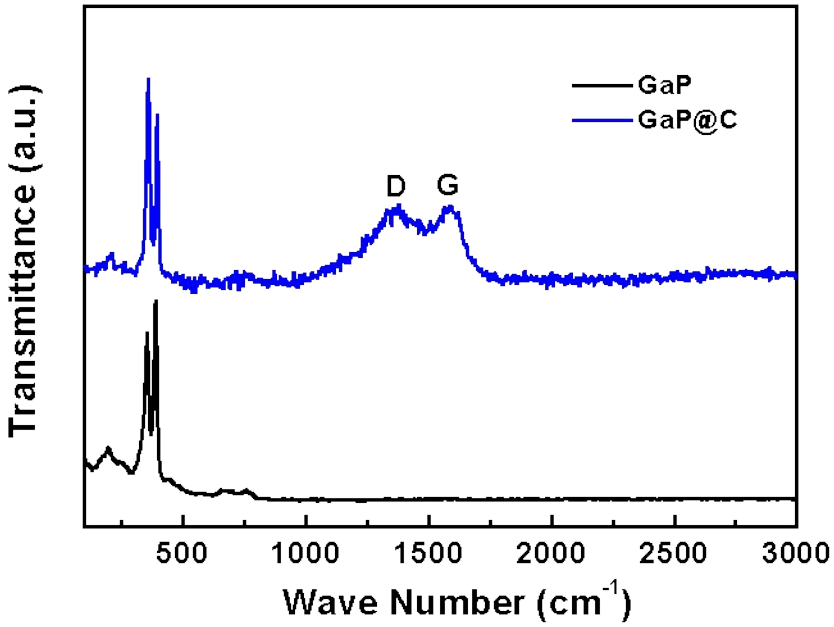

Figure S2 Raman spectra of GaP and GaP@C composite.

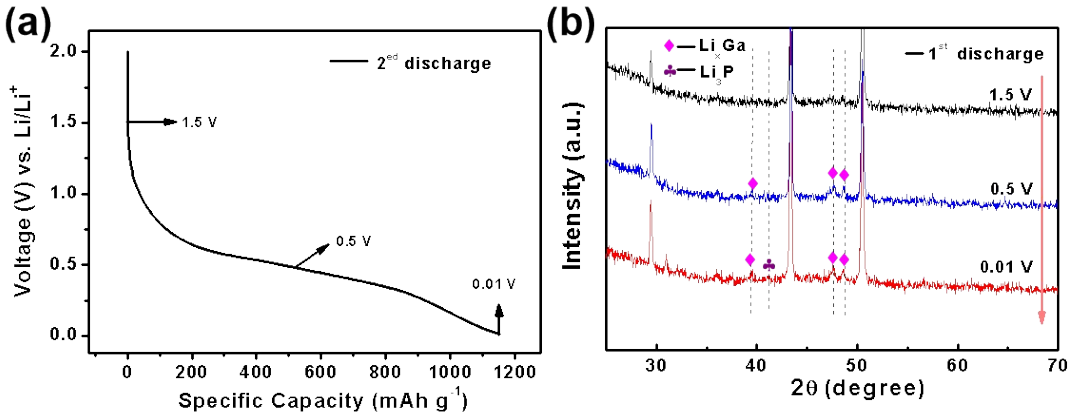

Figure S3 Discharge curve (a) of GaP@C at 2nd cycle and the ex-situ XRD patterns of GaP@C at different 2nd discharge potentials

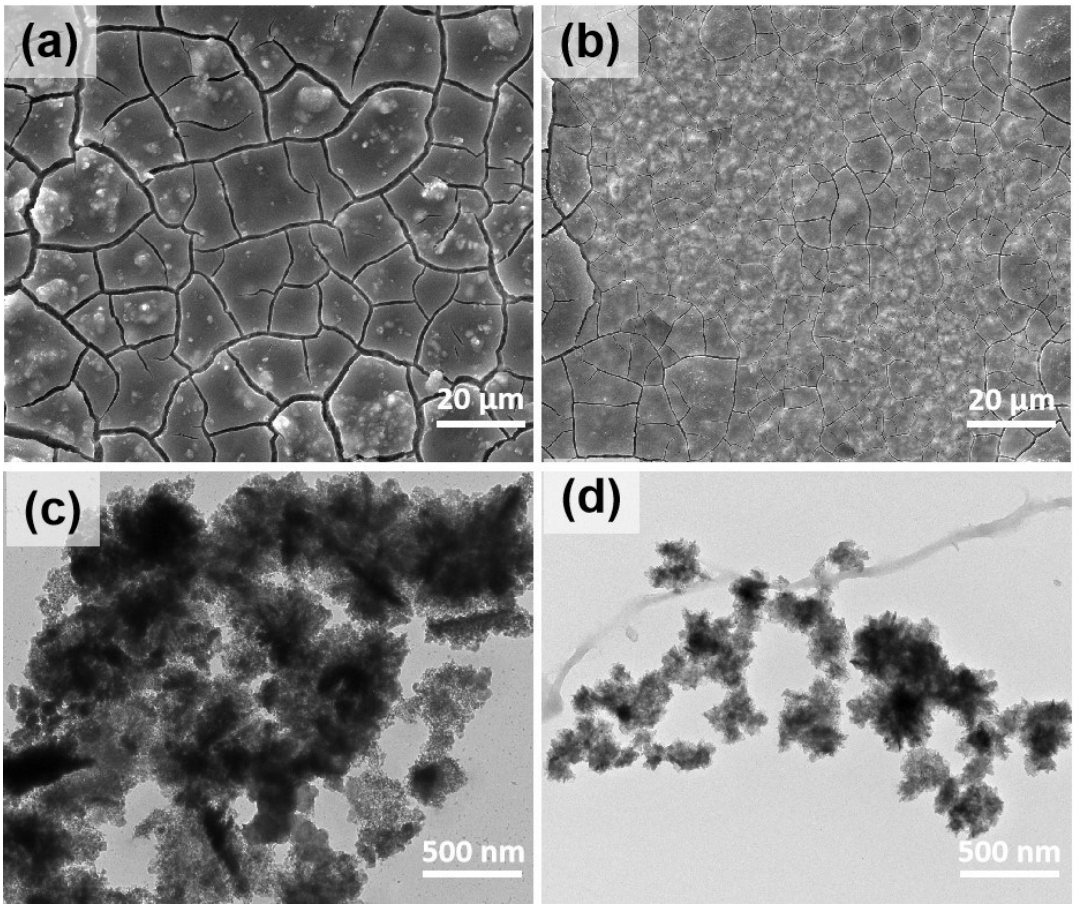

Figure S4 SEM(a, b) and TEM(c, d) images of GaP and GaP@C electrodes after 50 cycles.

Table S1 Recent progress on materials synthesis and electrochemical performance of TMPs anode for LIBs.

materials	rate	cycles	reversible capacity ($mAh\ g^{-1}$)	Ref
FeP@C	0.1C	70	609	[1]
FeP@C@rGO	0.1C	100	586	[2]
Mn1−xFexP	0.1 A g^{-1}	40	506	[3]
Sn4P3/graphite	0.1 A g^{-1}	100	651	[4]
V4P7	0.1 A g^{-1}	50	508	[5]
NiP3	0.1C	50	434	[6]
GaP	0.5A g^{-1}	60	305	This work
GaP@C	0.5A g^{-1}	100	832	This work

References

[1] F. Yang, H. Gao, J. Hao, S. Zhang, P. Li, Y. Liu, J. Chen, Z. Guo, Advanced Functional Materials, 29 (2019) 1808291.

[2] X. Wang, K. Chen, G. Wang, X. Liu, H. Wang, ACS nano, 11 (2017) 11602-11616.

[3] K.-H. Kim, W.-S. Kim, S.-H. Hong, Nanoscale, 11 (2019) 13494-13501.

[4] Y. Ding, Z.F. Li, E.V. Timofeeva, C.U. Segre, Advanced Energy Materials, 8 (2018) 1702134.

[5] K.-H. Kim, C.-H. Jung, W.-S. Kim, S.-H. Hong, Journal of Power Sources, 400 (2018) 204-211.

[6] Y. Lu, J.-p. Tu, Q.-q. Xiong, Y.-q. Qiao, X.-l. Wang, C.-d. Gu, S.X. Mao, RSC advances, 2 (2012) 3430-3436.