

Supplementary Information

Facile and elegant self-organization of Ag nanoparticles and TiO₂ nanorods on V₂O₅ nanosheets as a superior cathode material of lithium-ion batteries

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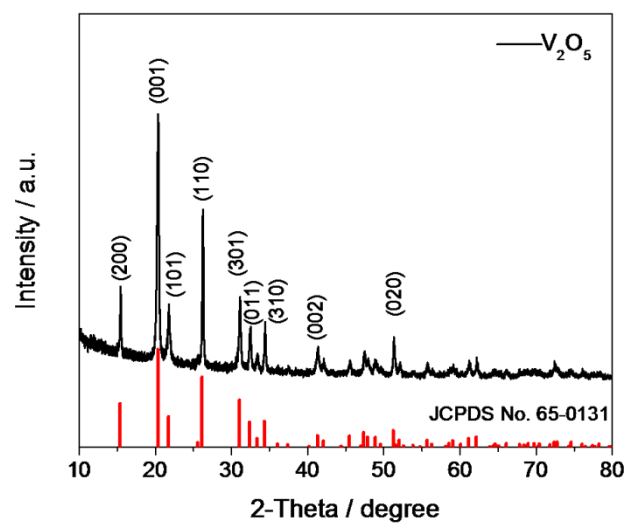


Fig. S1–XRD pattern of V_2O_5 nanosheets.

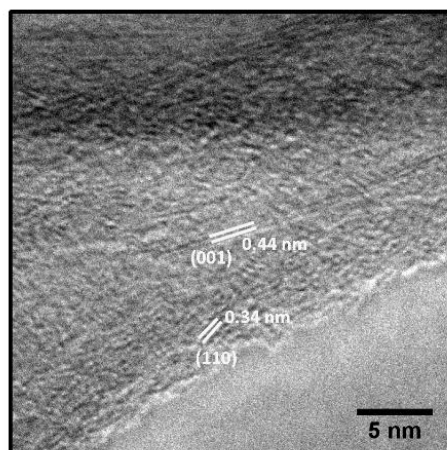


Fig. S2– HRTEM image of V₂O₅ nanosheets revealing lattice fringe distances of 0.44 and 0.34 nm corresponding to the (001) and (110) planes of V₂O₅ (*Nano Lett.*, 2010, **10**, 4750; *Small*, 2014, **10**, 3032; *Nanoscale*, 2013, **5**, 556).

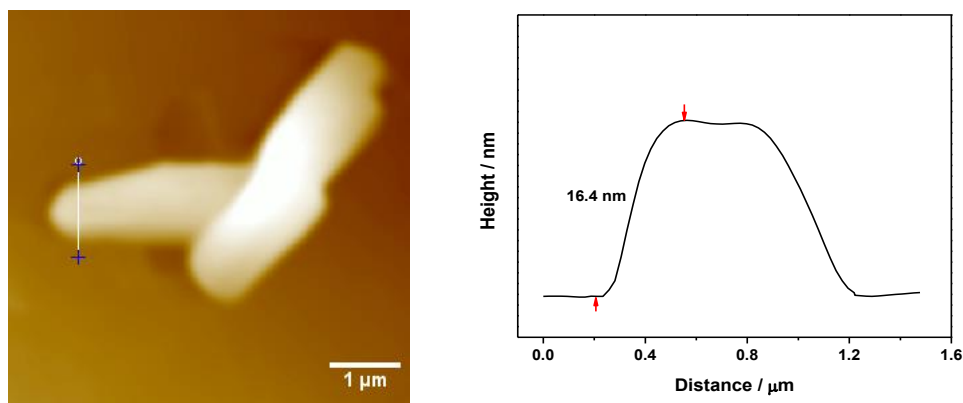


Fig. S3– AFM image of V_2O_5 nanosheets and the corresponding height profile. This image reveals V_2O_5 nanosheets with a lateral size on the micrometer scale and a thickness of 16.4 nm, corresponding to an aspect ratio of ~ 200 . This morphology (with relatively smooth surfaces) is in good agreement with what is observed under TEM and SEM, confirming the successful exfoliation of V_2O_5 nanosheets.

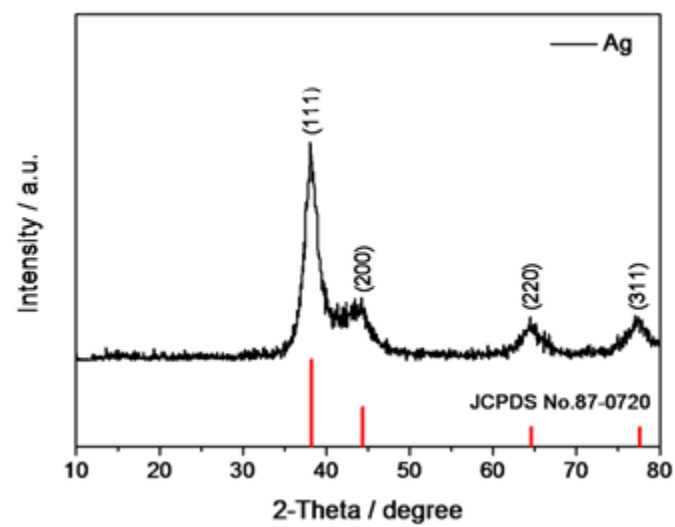


Fig. S4–XRD pattern of Ag nanoparticles.

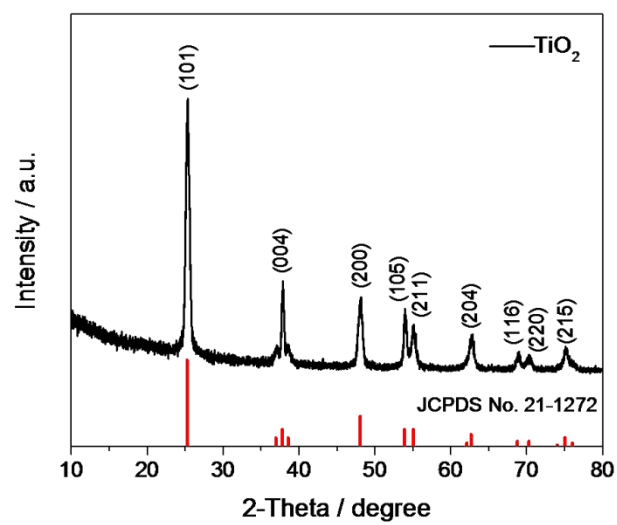


Fig. S5–XRD pattern of TiO₂ nanorods.

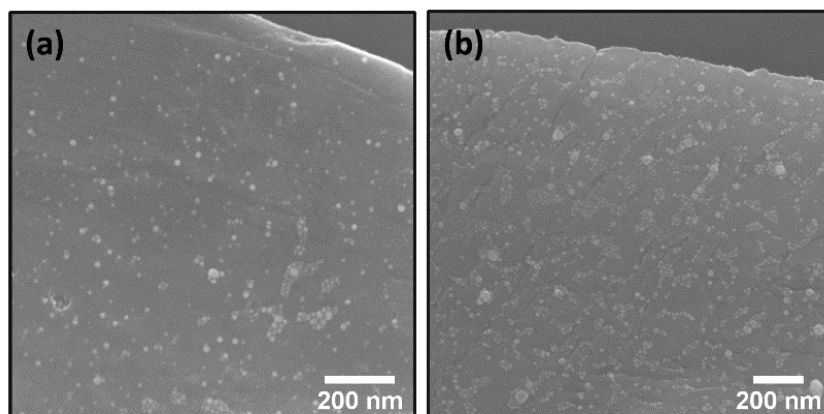


Fig. S6– SEM images of $\text{Ag}/\text{V}_2\text{O}_5$ hybrid architectures at weight ratios of (a) 10 : 100 and (b) 20 : 100.

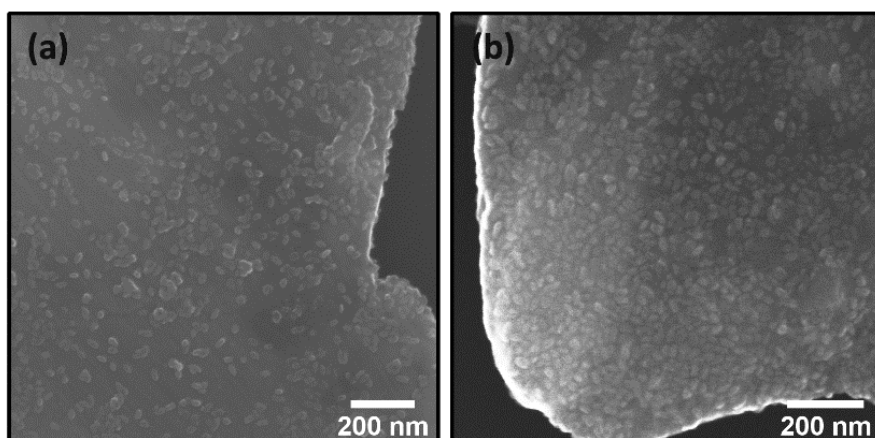


Fig. S7– SEM images of $\text{TiO}_2/\text{V}_2\text{O}_5$ hybrid architectures at weight ratios of (a) 10 : 100 and (b) 20 : 100.

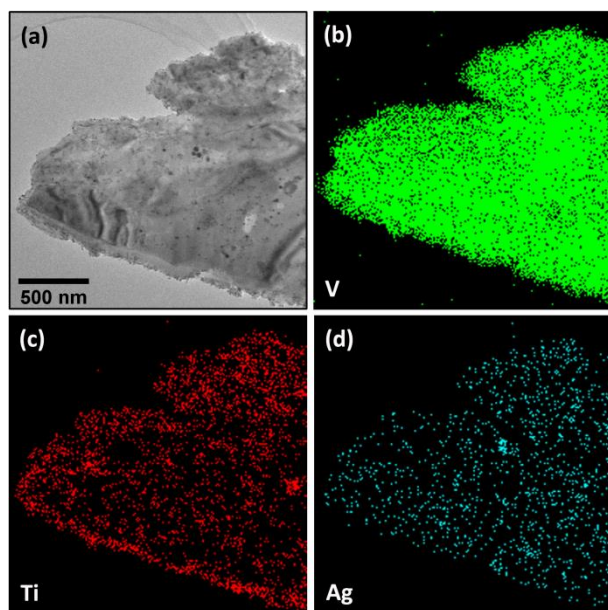


Fig. S8– (a) TEM image of Ag–TiO₂/V₂O₅ hybrid architectures and corresponding EDS maps of elemental (b) V, (c) Ti and (d) Ag.

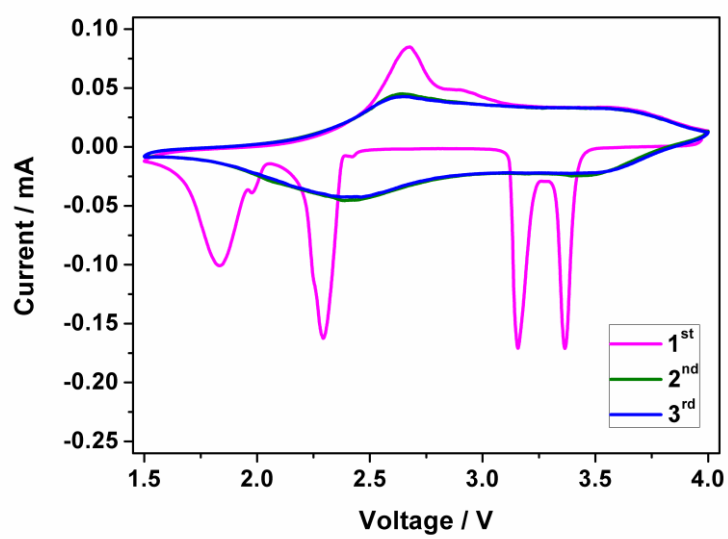


Fig. S9– Initial three CV curves of neat V_2O_5 nanosheets.

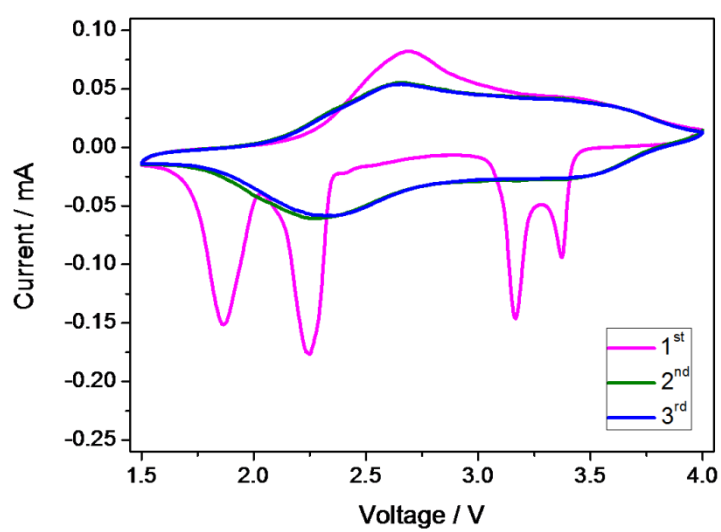


Fig. S10– Initial three CV curves of Ag/V₂O₅ hybrid architectures.

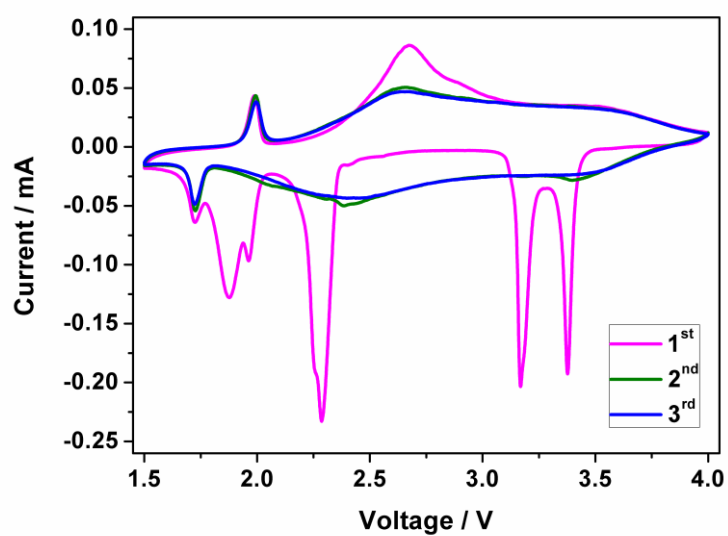


Fig. S11– Initial three CV curves of TiO₂/V₂O₅ hybrid architectures.

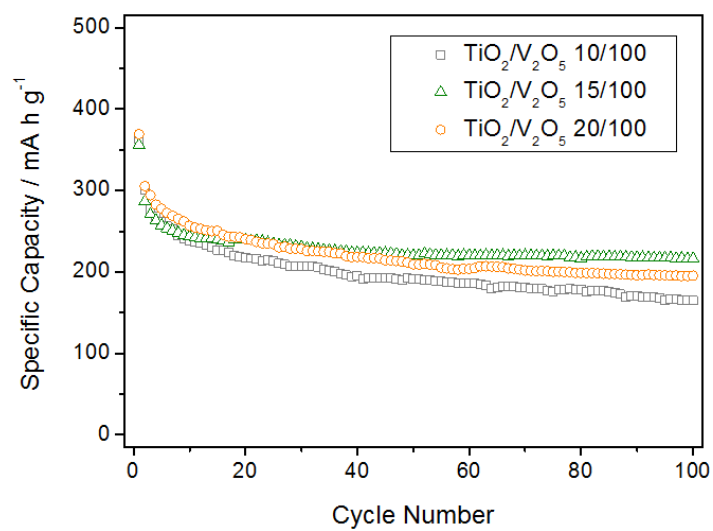


Fig. S12– Cycle behaviours of TiO₂/V₂O₅ hybrid architectures (10/100,15/100 and 20/100) at a current density of 100 mA g⁻¹.

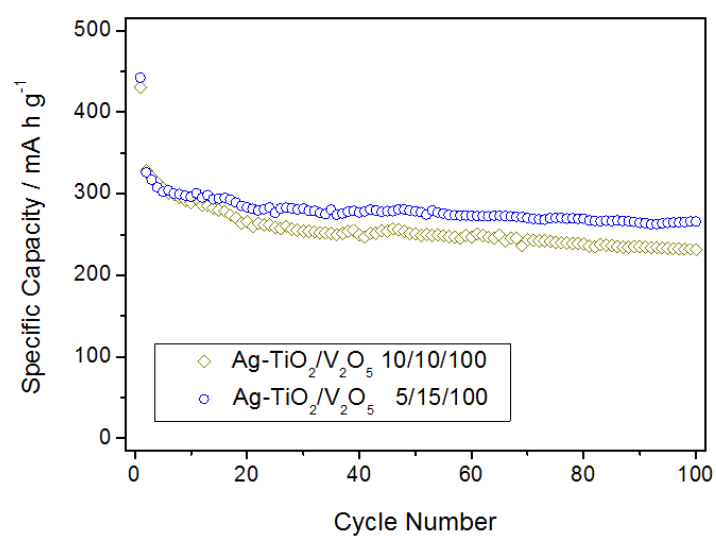


Fig. S13– Cycle behaviours of Ag–TiO₂/V₂O₅ hybrid architectures (5/15/100 and 10/10/100) at a current density of 100 mA g⁻¹.

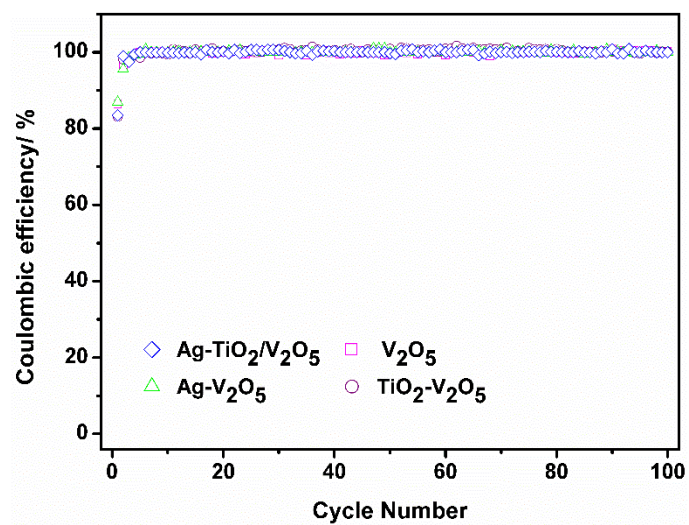


Fig.S14– Coulombic efficiencies of Ag/V₂O₅, TiO₂/V₂O₅ and Ag–TiO₂/V₂O₅ hybrid architectures as well as neat V₂O₅ nanosheets.

Table S1. Elemental composition of Ag/V₂O₅ (5/100), TiO₂/V₂O₅ (15/100) and Ag–TiO₂/V₂O₅ (5/15/100) hybrid architectures.

	Ag (wt%)	Ti (wt%)	V (wt%)	Octadecylamine- coated Ag (wt%)	Oleylamine-coat ed TiO ₂ (wt%)	V ₂ O ₅ (wt%)	Samples
Actual ratio	4.26	—	53.25	4.81	—	95.01	Ag/V ₂ O ₅ (5/100)
Starting ratio	—	—	—	4.76	—	95.24	
Actual ratio	—	6.22	48.32	—	12.50	86.22	TiO ₂ /V ₂ O ₅ (15/100)
Starting ratio	—	—	—	—	13.04	86.96	
Actual ratio	3.67	6.08	46.88	4.15	12.21	83.65	Ag–TiO ₂ /V ₂ O ₅ (5/15/100)
Starting ratio	—	—	—	4.17	12.50	83.33	