Electronic Supplementary Information (ESI)

V_2O_5 nanorod electrode material for enhanced electrochemical properties by facile hydrothermal method for supercapacitor applications

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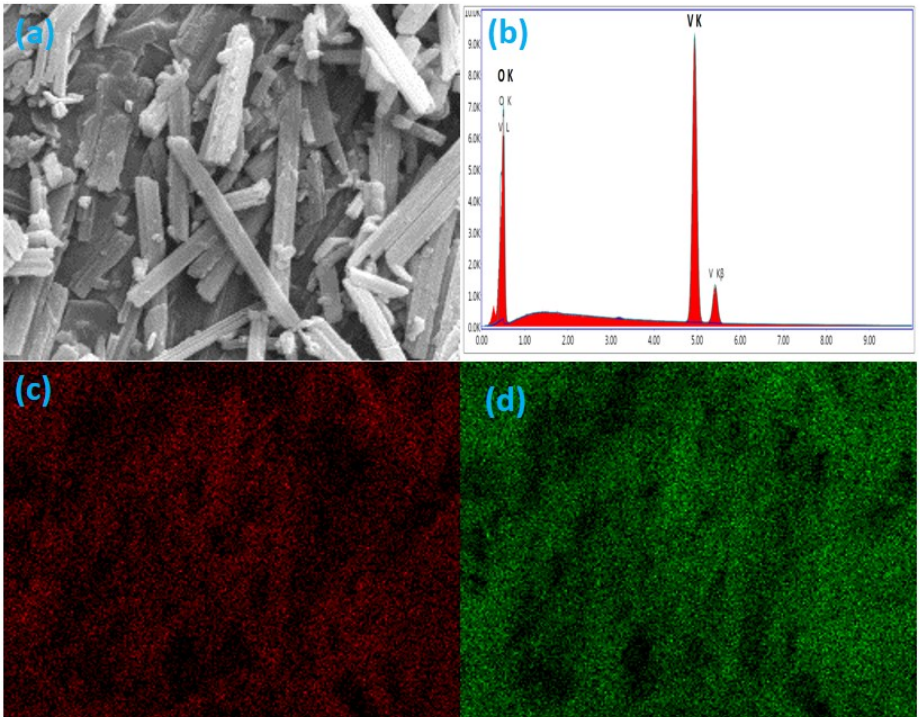

Fig. S1. (a) SEM image, (b) EDS spectrum, (c) Element mapping of V, (d) Element mapping of O for the V_2O_5 nanorods, indicating the homogeneous distribution of V and O in the nanorod.

The EDS spectrum and element mapping has performed during the SEM investigation, Fig. S1 shows the SEM, EDS spectrum and element mapping of V_2O_5 nanorods. The element mapping results clearly confirms the homogenous distributions of V and O in the V_2O_5 nanorod.

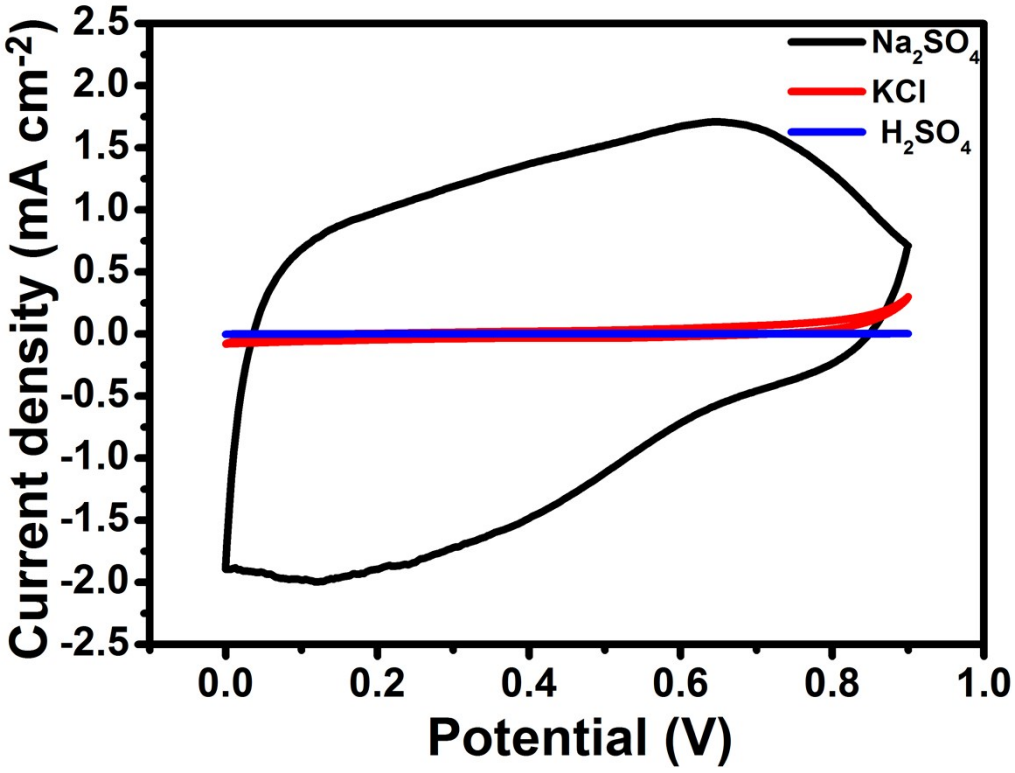

Fig. S2. CV analysis of V_2O_5 nanorod in different electrolyte measured at a scan rate of 25 mV s^{-1}.

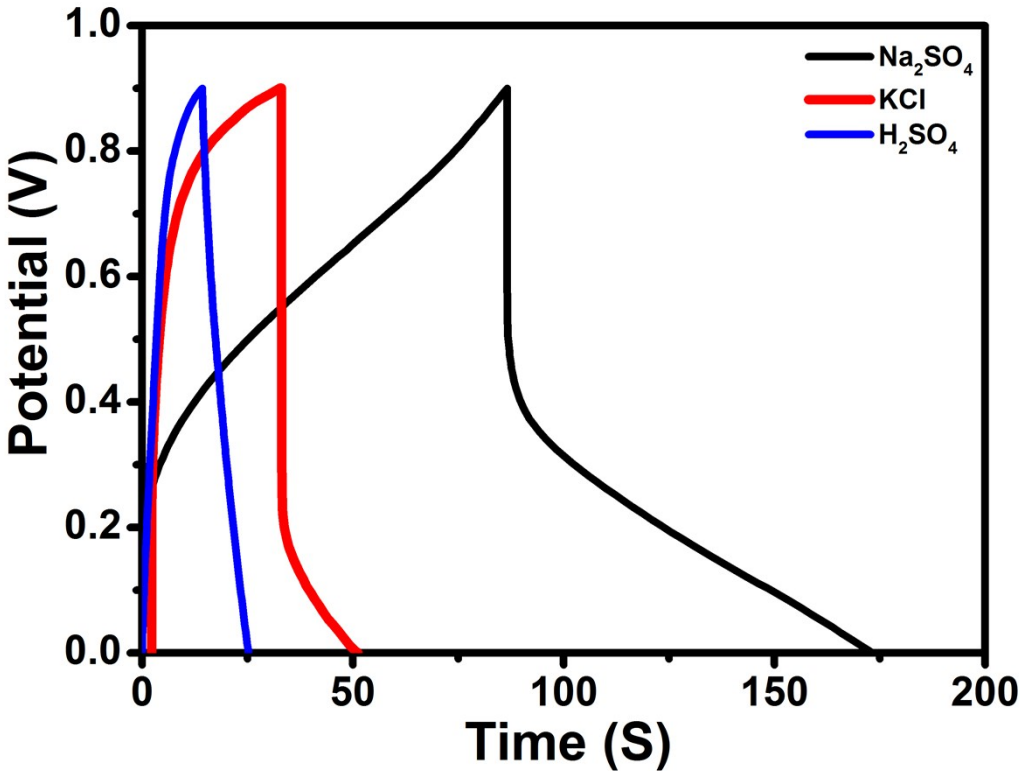

Fig. S3. CD analysis of V_2O_5 nanorod in different electrolyte measured at a current density of 0.3 mA cm^{-2}.

Table 1. Electrochemical properties of V_2O_5 nanorod with Na_2SO_4 electrolyte compare with some of the reported areal specific capacitance of supercapacitors.

Electrode material	Electrolyte	Areal Specific capacitance mF cm^{-2}	Ref
V_2O_5-rGO electrodes	$LiClO_4$	511	1
V_2O_5 nanorod	**Na_2SO_4**	**417**	**Our work**
MnO_2–PPy–carbon and V_2O_5–PANI– carbon fiber composites,	LiCl	613	2
V_2O_5 nanorod	**Na_2SO_4**	**417**	**Our work**
V_2O_5 complex surface architecture	$LiClO_4$	380	3
V_2O_5 nanorod	**Na_2SO_4**	**417**	**Our work**
Vanadium Oxide Nanowire–Carbon Nanotube	LiTFSl	38.5 F/g	4
V_2O_5 nanorod	**Na_2SO_4**	**417**	**Our work**

Reference

[1] C. Y. Foo, A. Sumboja, D. J. H. Tan, J. X. Wang and P. S. Lee, Advanced Energy Materials, 2014, 4.

[2] W. J. Liu, N. S. Liu, Y. L. Shi, Y. Chen, C. X. Yang, J. Y. Tao, S. L. Wang, Y. M. Wang, J. Su, L. Y. Li and Y. H. Gao, J Mater Chem A, 2015, 3, 13461-13467.

[3] B. Pandit, D. P. Dubal and B. R. Sankapal, Electrochim Acta, 2017, 242, 382-389..

[4] S. D. Perera, B. Patel, N. Nijem, K. Roodenko, O. Seitz, J. P. Ferraris, Y. J. Chabal and K. J. Balkus, Advanced Energy Materials, 2011, 1, 936-945.