Supporting Information

Study on Fabrication and Storage Capacity of Coal Tar Pitch Based V_2O_3@C Composite Materials

Jianke LI,[a] Xincheng MIAO,[a]* Shenhao WANG,[a] Shaobei CHEN,[a] Beibei HAN,[b,c] Guiying XU,[a]* Kun WANG,[a]* Baigang AN,[a] Dongying JU,[c,d] Weimin ZHOU,[a]*§

[a] *University of Science and Technology Liaoning, No. 189 Qianshan Middle Road, Anshan 114051, China.*

[b] *Key Laboratory of Advanced Fuel Cells and Electrolyzers Technology of Zhejiang Province, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, No. 1219 Zhongguan West Road, Zhejiang 315201, China.*

[c] *Advanced Science Research Laboratory, Saitama Institute of Technology, 1690 Fusaiji, Fukaya, Japan.*

[d] *Hainai University, 58 Renmin Avenue, Haikou 570228, China.*

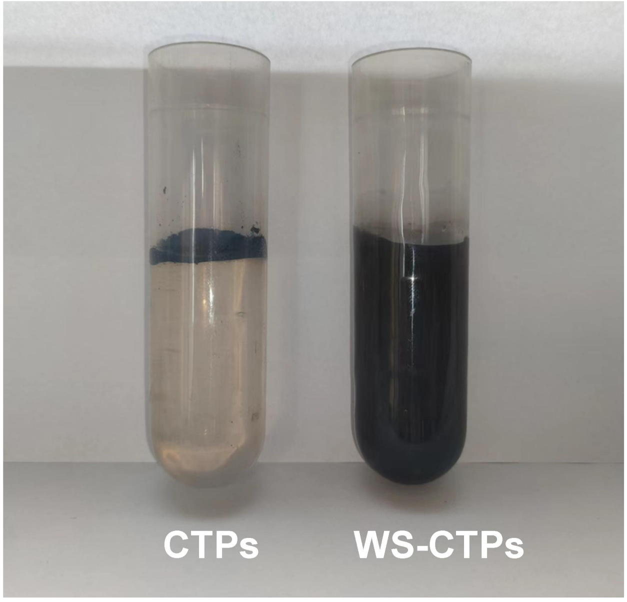

Figure S1. States in water of CTPs and WS-CTPs.

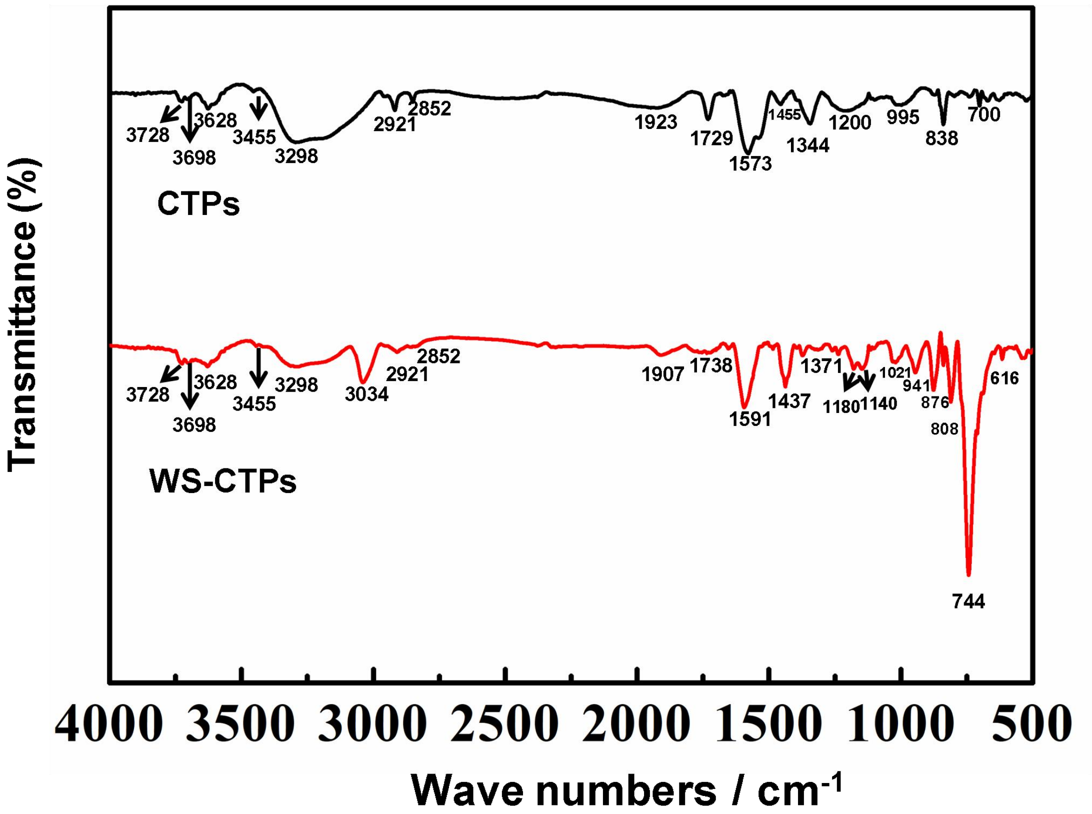

Figure S2. FT-IR measurement results of coal tar pitches (CTPs) and water soluble pitches (WS-CTPs).

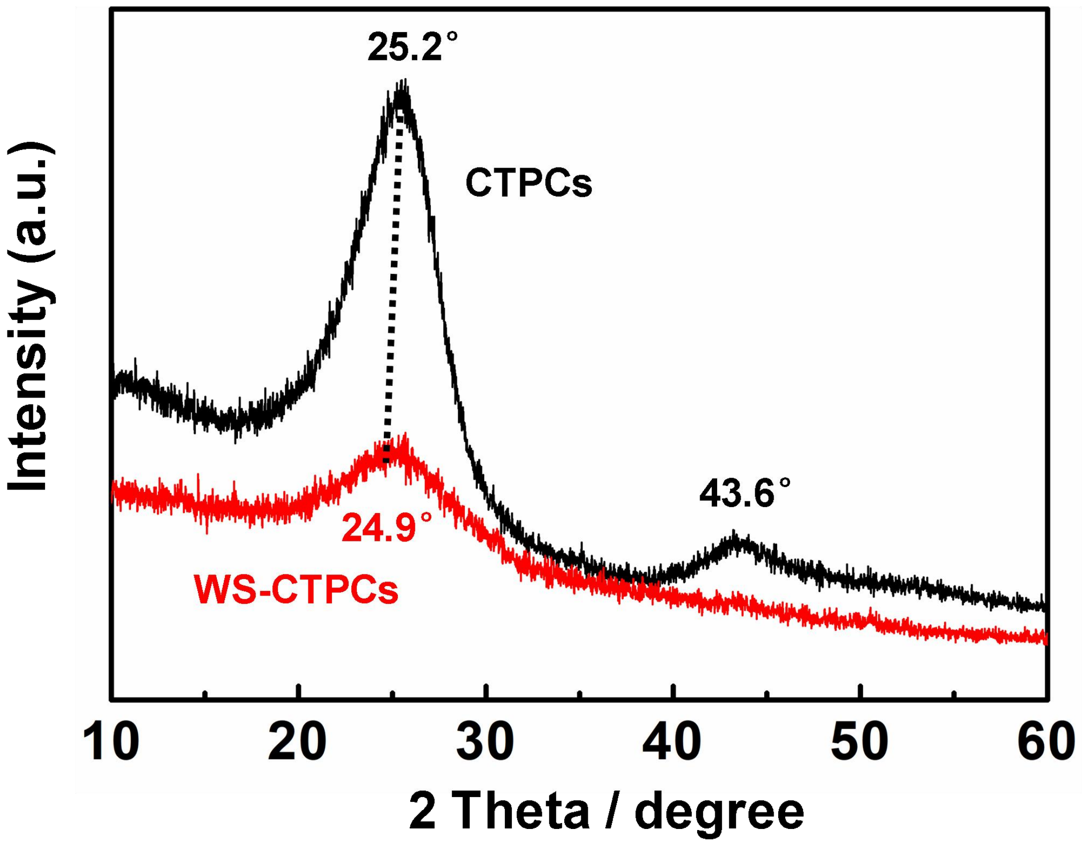

Figure S3. XRD measument results of coal tar pitch based carbons (CTPCs) and water soluble coal tar pitch besed carbons (WS-CTPCs).

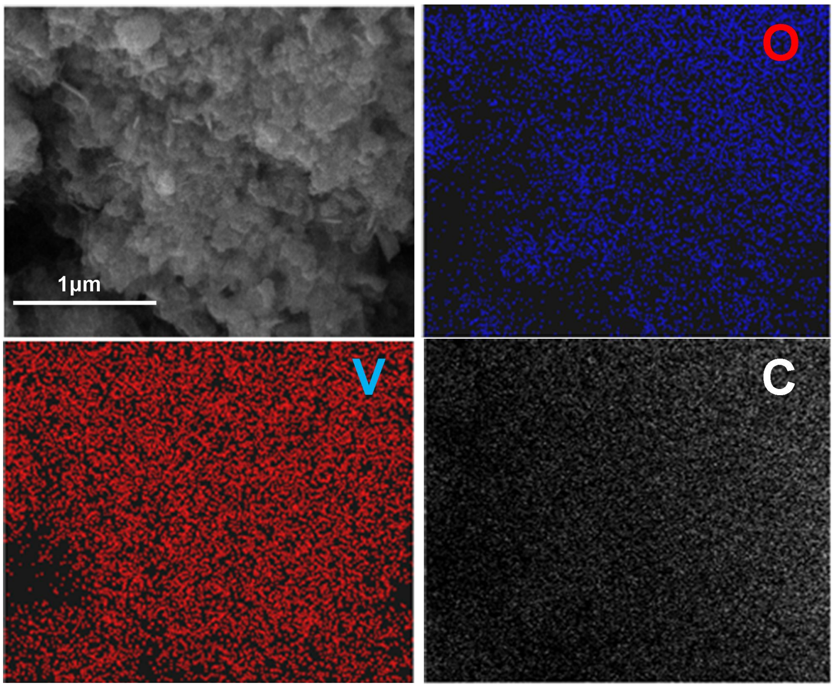

Figure S4. SEM-EDS images of V_2O_3@C-2 composite materials.

Table S1. Characteristic parameters about structure and specific surface area of WS-CTPCs, V_2O_3@C-1, V_2O_3@C-2 and V_2O_3@C-4. S_{BET} = total BET surface area; V_{total} = total pore volume.

Samples	S_{BET} ($m^2 \cdot g^{-1}$)	V_{total} ($cm^3 \cdot g^{-1}$)
WS-CTPCs	24.647	0.0336
V_2O_3@C-1	100.887	0.5726
V_2O_3@C-2	111.023	0.3740
V_2O_3@C-4	70.630	0.3297

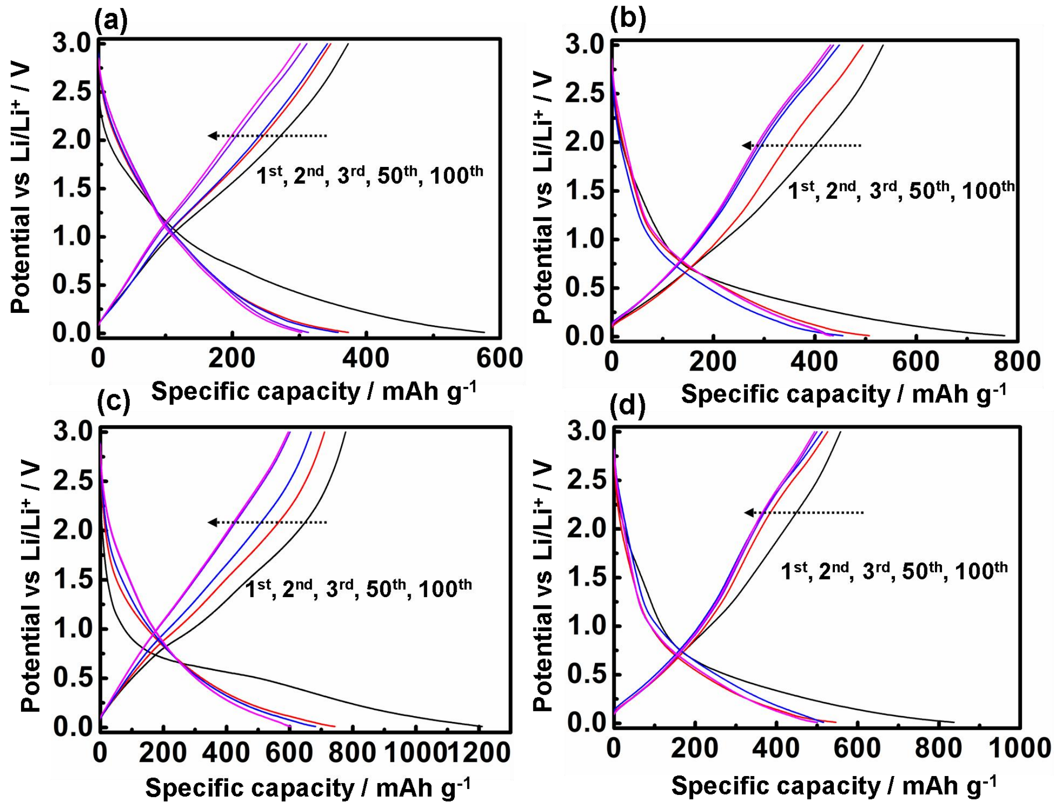

Figure S5. Charge-discharge curves of V_2O_3 and V_2O_3@C composite materials.

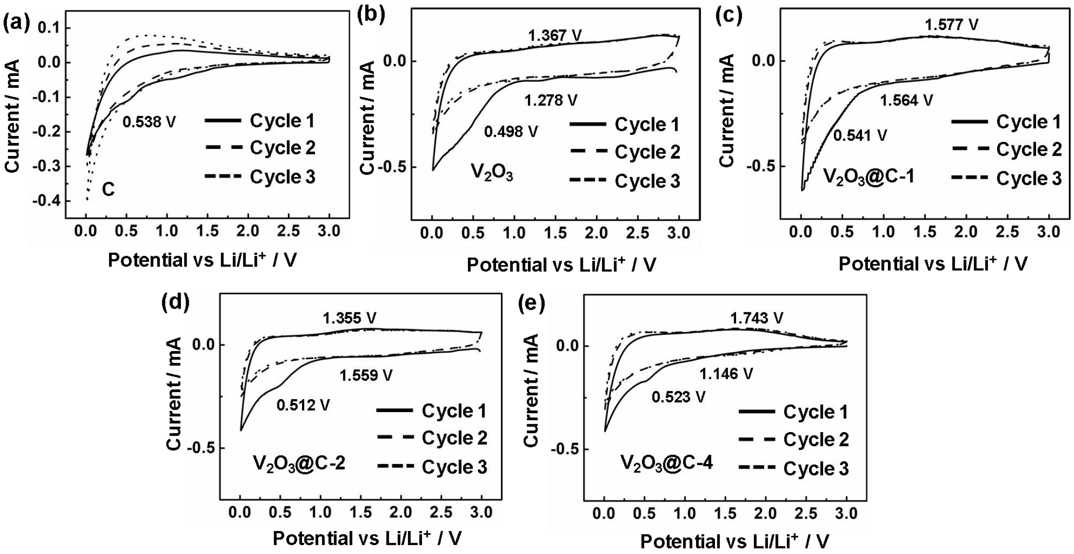

Figure S6. CV measurement results of WS-CTPCs (a), V_2O_3 (b) and V_2O_3@C composite materials (c).

Table S2. Composites capacity at different current densities

	WS-CTPCs （mAh g^{-1}）	V_2O_3 (mAh g^{-1})	V_2O_3@C-1 （mAh g^{-1}）	V_2O_3@C-2 （mAh g^{-1}）	V_2O_3@C-4 （mAh g^{-1}）
0.1 A/g	222.3	301.9	499.6	617.6	371.1
0.2 A/g	143.0	296.8	397.8	518.7	370.5
0.5 A/g	95.0	235.0	366.3	423.2	311.0
1.0 A/g	81.6	161.7	313.6	391.7	276.0
2.0 A/g	51.0	93.3	275.4	303.3	227.2
5.0 A/g	40.5	48.6	183.4	239.0	119.4

Table S3. Illustrations of resistances of V_2O_3, V_2O_3@C composite materials.

Samples	R_1 / ohm	R_2 / ohm	R_3 / ohm
V_2O_3	3.4	163.9	363.2
V_2O_3@C-1	3.1	159.2	332.1
V_2O_3@C-2	3.1	163.3	152.4
V_2O_3@C-4	3.1	131.3	120.2

Table S4. Capacity of V_2O_3@C-2 and other reported materials at 0.1 A g^{-1}.

Samples	Capacity / mAh g^{-1} at 0.1 A g^{-1}	Ref.
V_2O_3@C-2	580.2	This work
V_2O_3/VC-CDC-1:2	225.0	1
YKS	437.5	2
V_2O_3@C-5	445.3	3
NC@V_2O_3	400.0	4
V_2O_3-OMC	541.0	5
V_2O_3-rGO	380.0	6

References

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