

Supporting information

In the pristine article, ECNFs with different carbonization temperature were prepared and their CV behaviors in the electrolyte containing 0.1 M VO_2^+ and 2.0 M H_2SO_4 were investigated at scan rate of 2 mV s^{-1} (Fig. 9 as show in the revised manuscript). The electrochemical parameters for $\text{VO}_2^+/\text{VO}^{2+}$ redox couple according to the Fig. 9 are also listed (Table 2 in the revised manuscript). For all samples, the peak potential separation (ΔE_p) for the redox couple increases firstly and then decreases when the carbonization temperature increases. The carbonization temperature of $1300 \text{ }^\circ\text{C}$ is the turning point. It indicates the electrochemical reversibility of $\text{VO}_2^+/\text{VO}^{2+}$ redox couple on the ECNFs becomes bad firstly and then recovers to the original with the increase of carbonization temperature. The exotic phenomenon may be caused by the coupling effect of structure and surface characteristics of the ECNFs on its electrochemical activity.

In order to ensure the preciseness and reproducibility of experimental data, the contrast experiment analyses were carried out and the CV curves of ECNFs with different temperature are as shown in Fig. 1 as below. Compared with the CV behaviors of ECNFs with different temperature in Fig. 9 in the revised manuscript, there is little variation existed in the overall tendency except for the small differences in the exact figures. The detailed CV parameters according to the Fig. 1 are listed in Table 1, which also shows that the peak potential separation (ΔE_p) for the redox couple increases firstly and then decreases with the increasing temperature and the carbonization temperature of $1300 \text{ }^\circ\text{C}$ is the turning point. Consistent with the CV results of the Fig. 9 in the revised manuscript, it indicates the electrochemical reversibility of $\text{VO}_2^+/\text{VO}^{2+}$ redox couple on the ECNFs becomes bad firstly and then recovers to the original with the increase of carbonization temperature, and the exotic phenomenon may be caused by the coupling effect of

structure and surface characteristics of the ECNFs on its electrochemical activity. With the consideration of the inevitable differences in the parallel test, it was concluded that the test results were credible and reproducible.

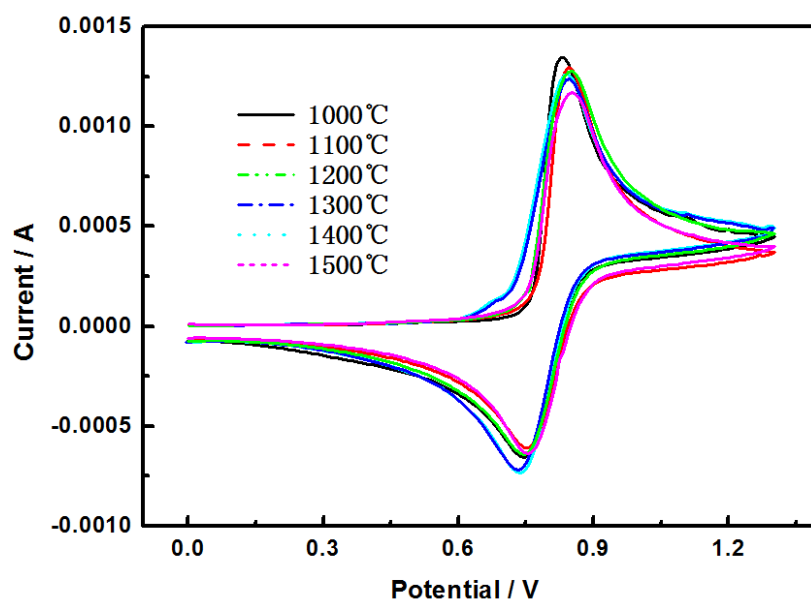


Fig. 1. CV curves for $\text{VO}_2^+/\text{VO}^{2+}$ redox couple on the ECNFs at different carbonization

temperature recorded at 2 mV s^{-1} scan rate in $0.1 \text{ M VOSO}_4 + 2.0 \text{ M H}_2\text{SO}_4$.

Table 1. Parameters recorded by the CV curves for $\text{VO}_2^+/\text{VO}^{2+}$ couple on the ECNFs carbonized at different temperature.

Temperature (°C)	I_{pa} (mA)	I_{pc} (mA)	I_{pa}/I_{pc}	E_a (V)	E_c (V)	ΔE_p (V)
1000	1.340	-0.685	1.956	0.828	0.744	0.084
1100	1.291	-0.608	2.123	0.840	0.746	0.094
1200	1.280	-0.736	1.739	0.850	0.736	0.114
1300	1.240	-0.719	1.724	0.848	0.727	0.121
1400	1.296	-0.608	1.717	0.846	0.751	0.095
1500	1.171	-0.638	1.835	0.852	0.755	0.097