Supporting Information

Two-dimensional hybrid of SbO_x nanoplates encapsulated by carbon flakes as a high performance sodium storage anode

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Fig. S1. XRD patterns of (a) Sb@CF and (b)SbOx@CF

Composion calculations of SbO_x@CF, SbO_x@C and Sb@CF

Since the oxidation product of $SbO_x@CF$ sample at 900°C is Sb_2O_4 , as confirmed by the XRD result (Fig. S2a). According to the TG curve in Fig. S2b, the content of $SbO_{0.13}$ in $SbO_{0.13}@CF$ can be calculated to be 67.7wt% based on the equation S1.

$$SbO_{0.13}(wt\%) = \frac{2 \times molecular \ weight \ of \ Sb_2O_4}{molecular \ weight \ of \ Sb_2O_4} \times \frac{\text{final weight of } Sb_2O_4}{\text{initial weight of composite}} \times 100\%$$
(1)

 $O(wt\%, in SbO_{0.13})$

$$= \frac{0.13 \times molecular \ weight \ of \ 0}{molecular \ weight \ of \ SbO_{0.13}}$$

$$\times 100\%$$
(2)

 $O(wt\%, in Sb_2O_3)$

$$= \frac{3 \times molecular \ weight \ of \ 0}{molecular \ weight \ of \ Sb_2O_3}$$

$$\times 100\% \tag{3}$$

Based on the Equation S2 and S3, the O content in SbO_{0.13} and Sb₂O₃ can be calculated to be 1.7 and 16.1wt%, respectively. Thus, Sb₂O₃ in SbO_{0.13} can be further calculated to be 10.6 wt% (1.7 wt% /16.1 =10.6 wt%). As a result, the content of Sb₂O₃ in SbO_{0.13}@CF hybrid can be calculated to be 7.2 wt% (10.6×67.7 wt%=7.2 wt%), and Sb in SbO_{0.13}@CF hybrid is 60.5 wt% (67.7 wt%-7.2 wt%=60.5 wt%). Similarly, contents of Sb oxides and carbon in SbO_x@C sample (x=0.34) are calculated to be 61.8 and 38.2 wt% based on the TG result, and contents of Sb₂O₃ and Sb in SbO_x@C sample are further calculated to be 16.4 and 45.4 wt%. In a same way, contents of Sb and carbon in Sb@CF sample also can be calculated to be 53.1 and 46.9 wt% based on the TG result, respectively.



Fig.S2. (a) XRD pattern of SbOx@CF treated in air at 900°C. (b) TG curves of as-prepares samples

Table S1

Elemental analysis results of SbO_x@CF and SbO_x@C

Samples	C (wt%)	H (wt%)	O (wt%)	Sb (wt%)
SbO _x @CF	27.5	0.9	3.6	68.0
SbO _x @C	29.8	1.1	5.4	63.7



Fig. S3. (a) SEM image and (b) TEM image of Sb@CF.



Fig.S4. EXD spectrum of SbO_x@CF.



Fig. S5. SEM images of products with different amount of NaCl. (a) 2g, (b) 3g, (c) 4g and (d) 5g.





Fig. S6. (a) Comparison of the 2^{nd} CV curves of SbO_x@CF and carbon electrode. (b)The initial three charge and discharge profiles, and (c) cycling performance of carbon electrode at a current density of 100 mA g⁻¹. The initial three charge and discharge profiles of (d) Sb@CF electrode, and (e) SbO_x@C electrode at a current density of 100 mA g⁻¹. (f) Comparison of the 3^{rd} charge and discharge profiles of SbO_x@C and SbO_x@CF electrodes at a current density of 100 mA g⁻¹.