

Supplementary Material

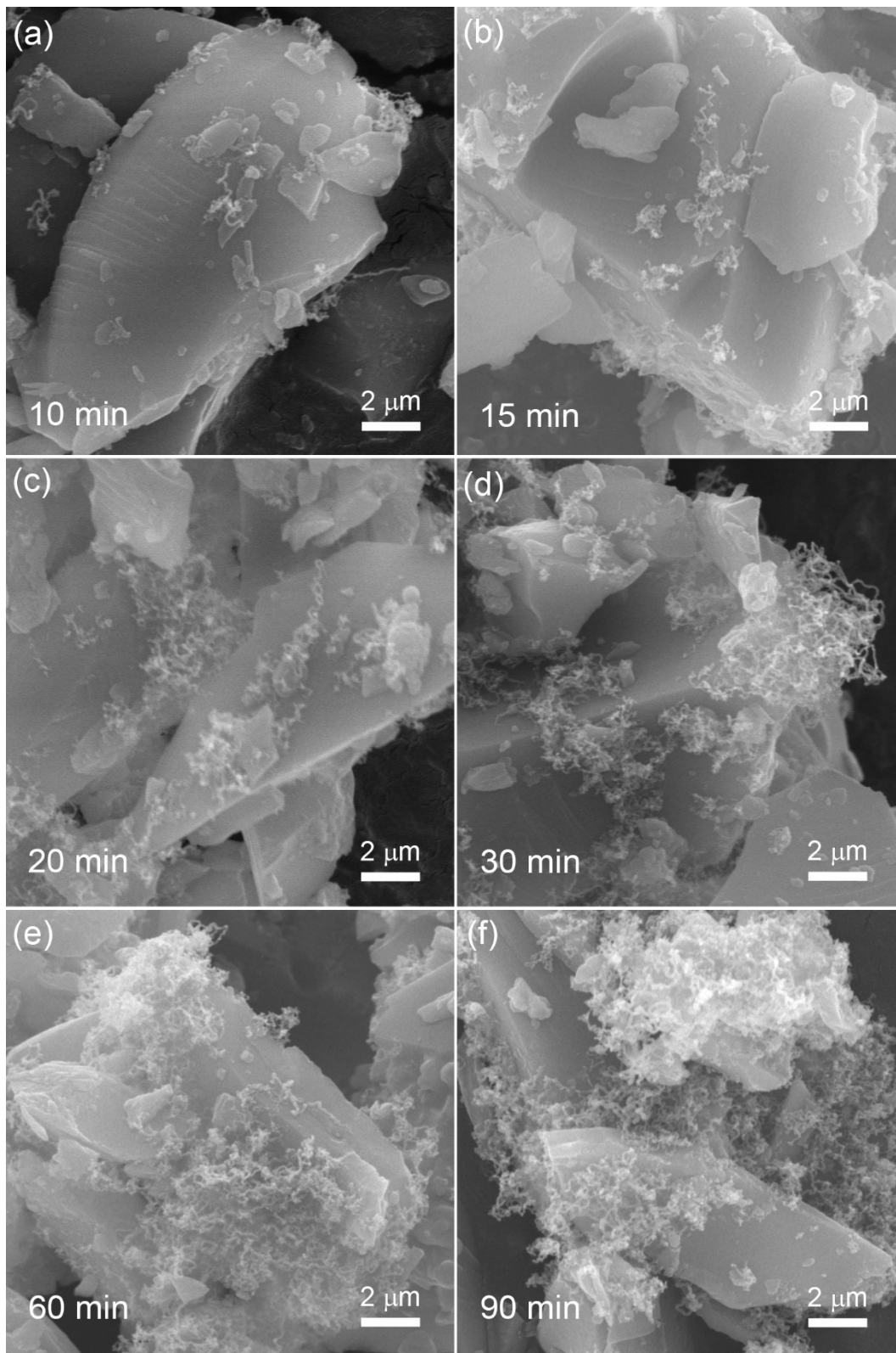


Fig. S1. SEM images of SiO under different deposition times at 500 °C.

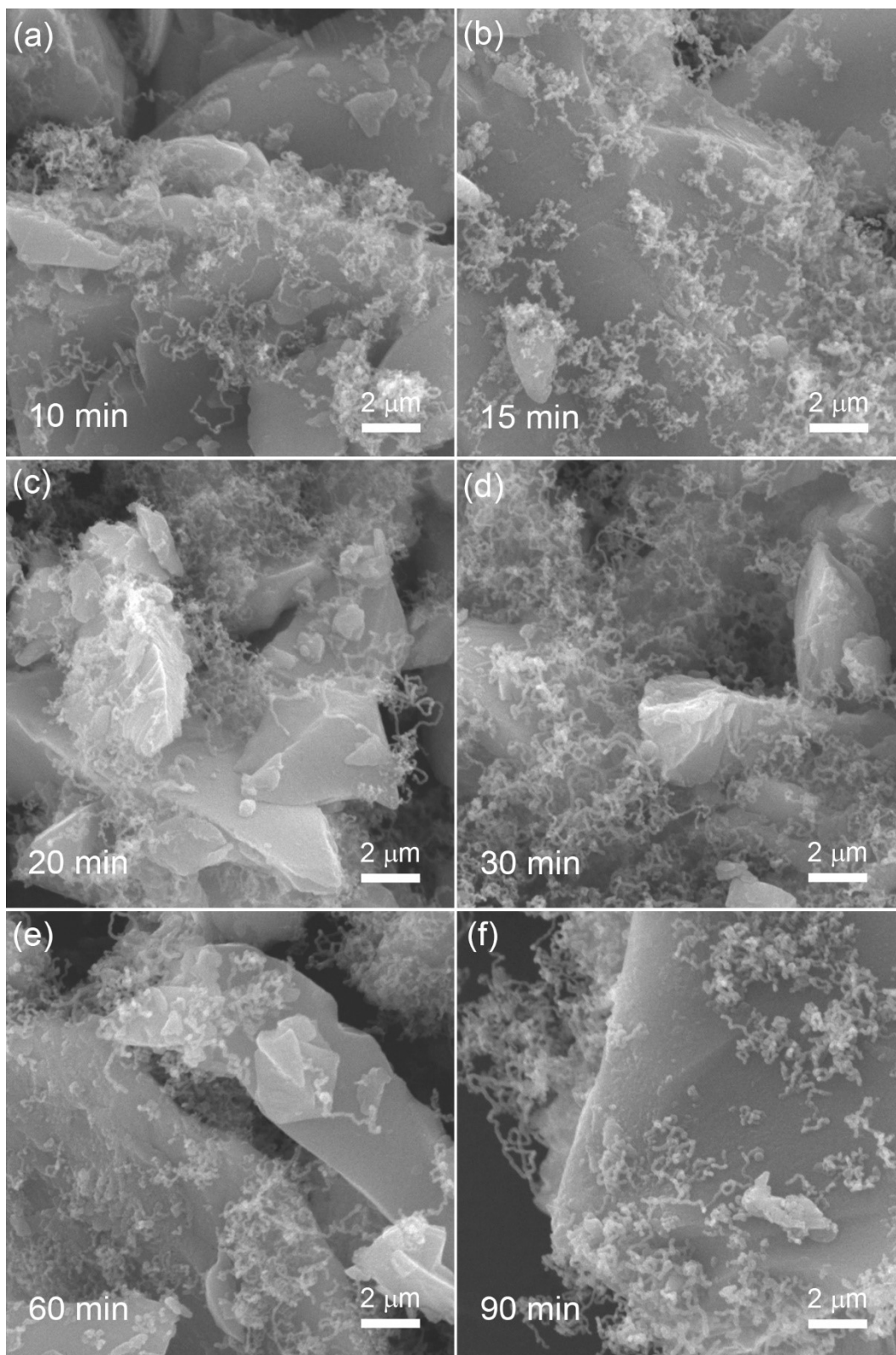


Fig. S2. SEM images of SiO under different deposition times at 600 °C.

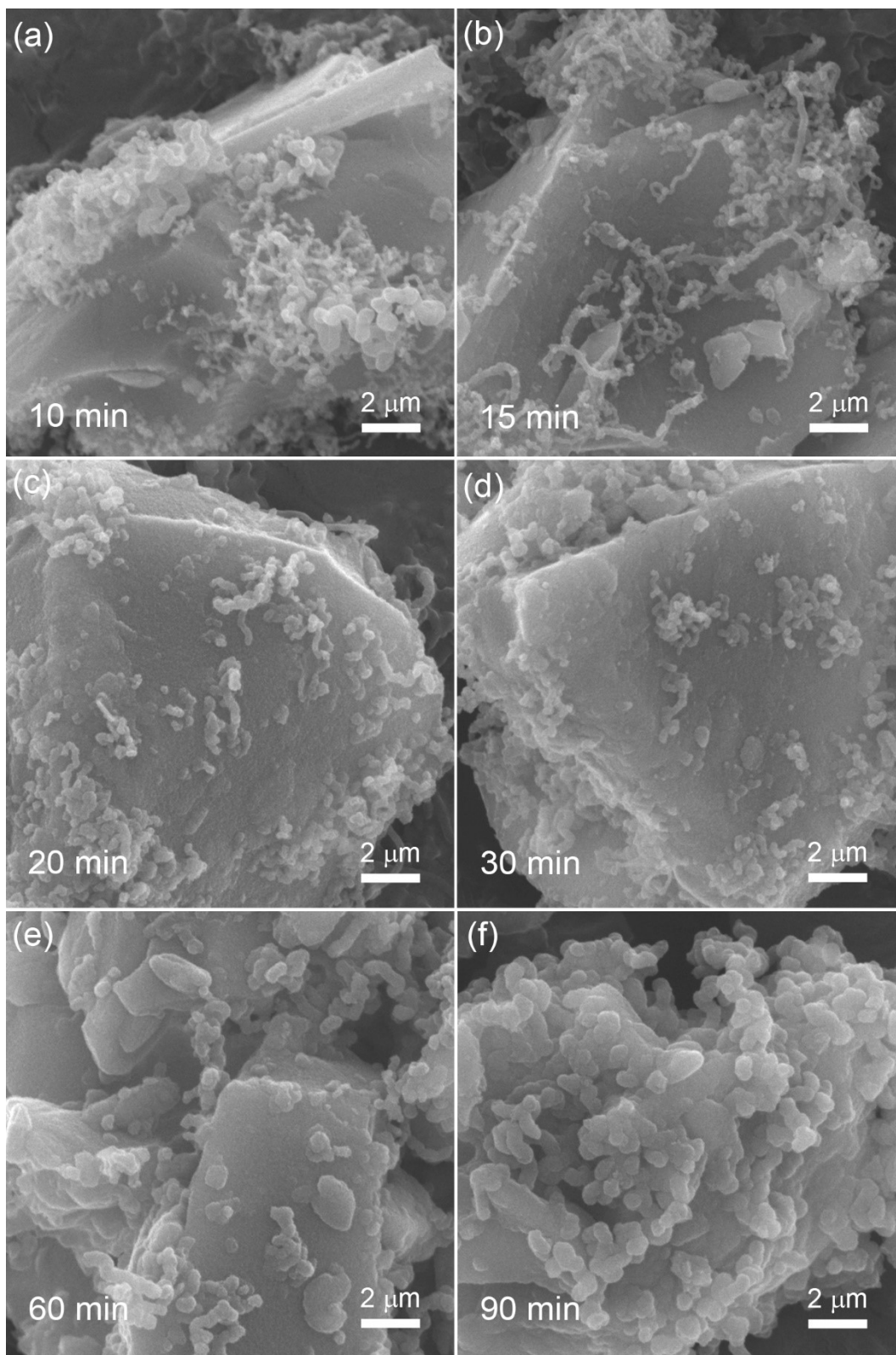


Fig. S3. SEM images of SiO under different deposition times at 700 °C.

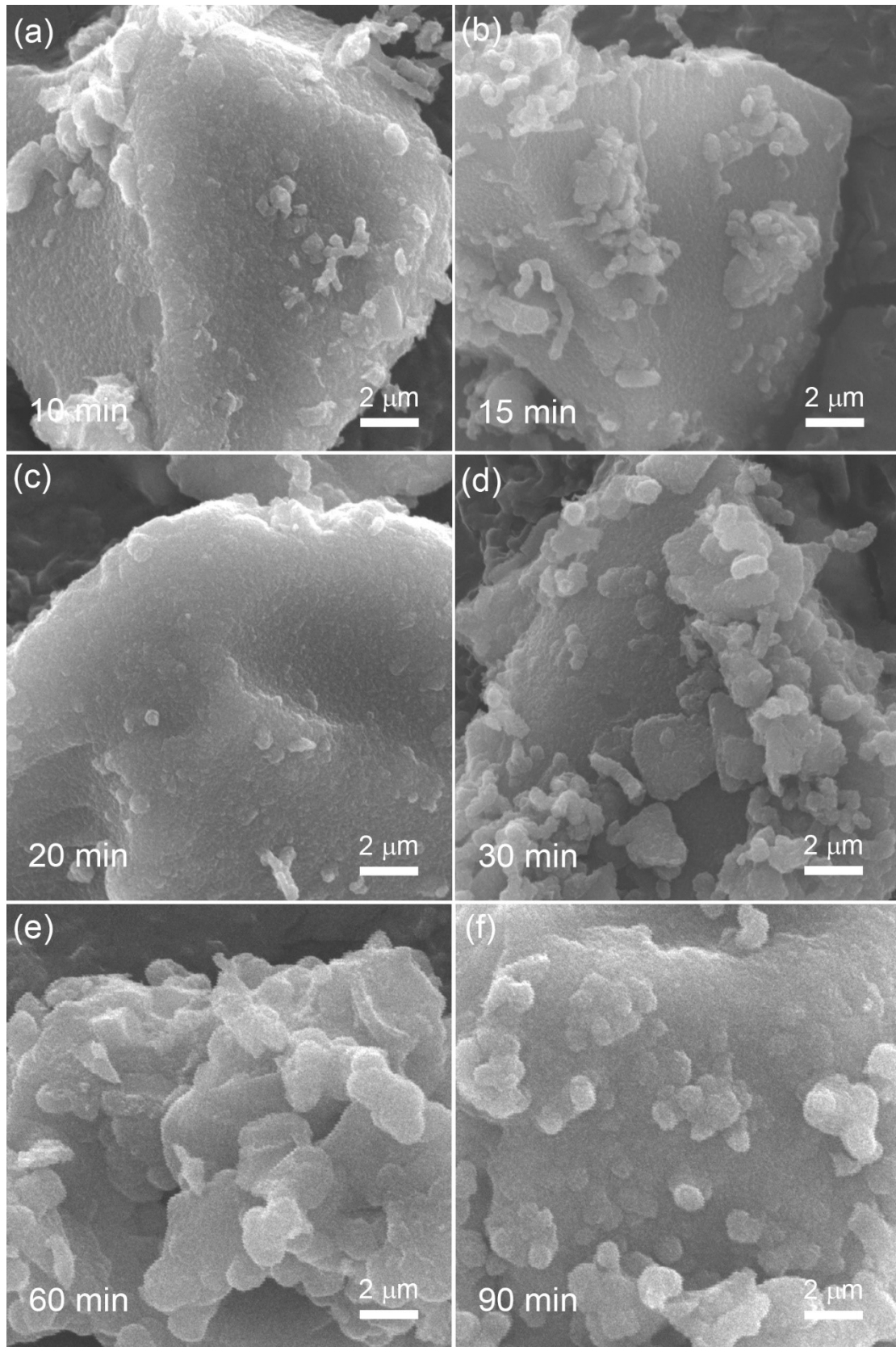


Fig. S4. SEM images of SiO under different deposition times at 800 °C.

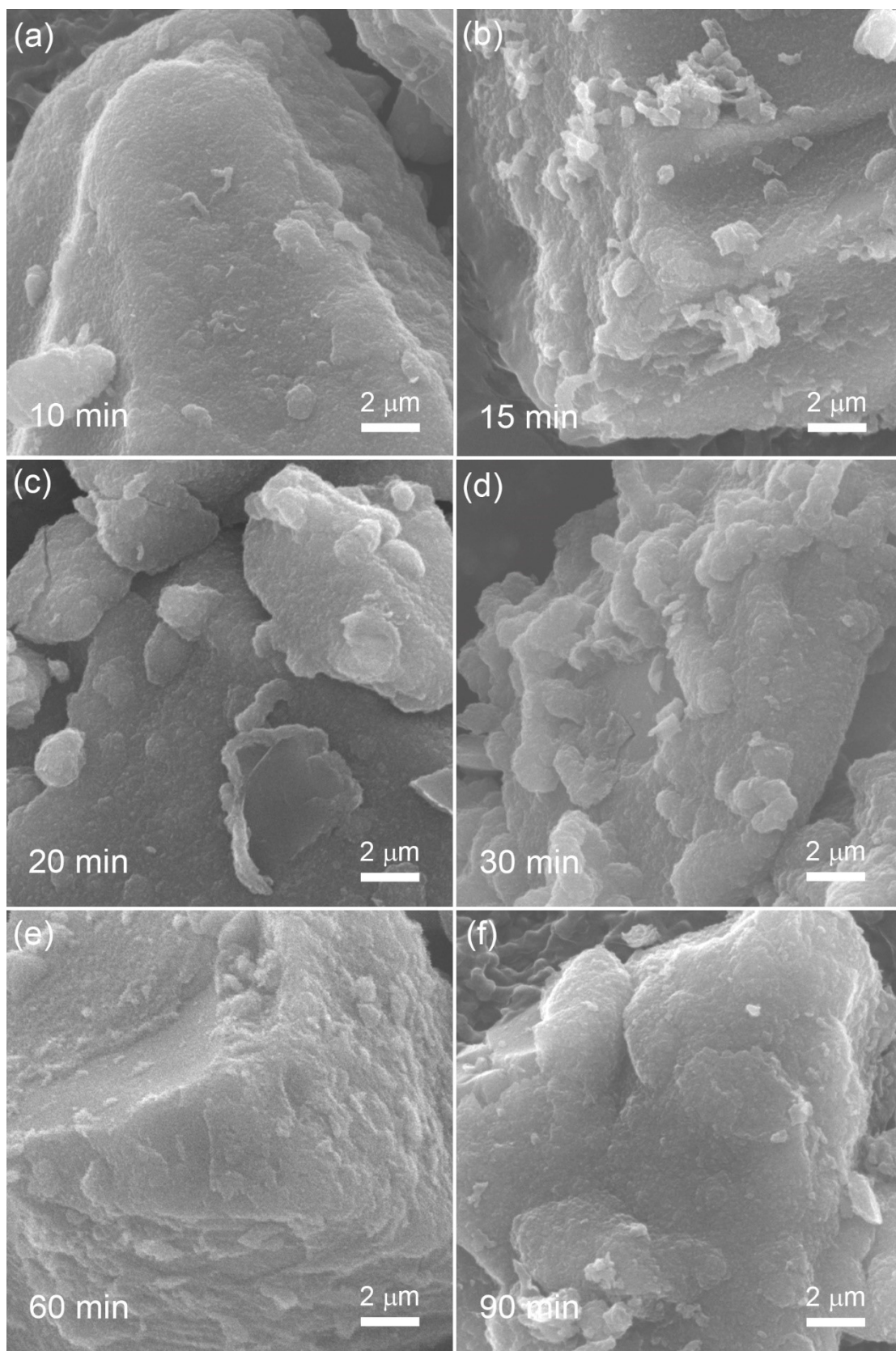


Fig. S5. SEM images of SiO under different deposition times at 900 °C.

Table S1 The 1D-C and a-C contents of different samples at 700 °C.

Time (min)	1D-C content (wt. %)	a-C content (wt. %)
10	1.96	7.89
15	1.99	9.81
20	2.01	10.79
30	2.36	17.24
60	2.88	32.87
90	2.83	37.67

The results in the table are derived from the following formula, which is corrected by the empirical formula in the literature [32]:

$$I_D/I_G = 1.821 - 0.1002x + 0.00367x^2 - 6.589E-5x^3 + 5.486E-7x^4 - 1.712E-9x^5$$

The term of x is the percentage of 1D-C in total carbon. According to the practical x, the numerical solution of I_D/I_G can be obtained. The total carbon content multiplied by x is the content of 1D-C.

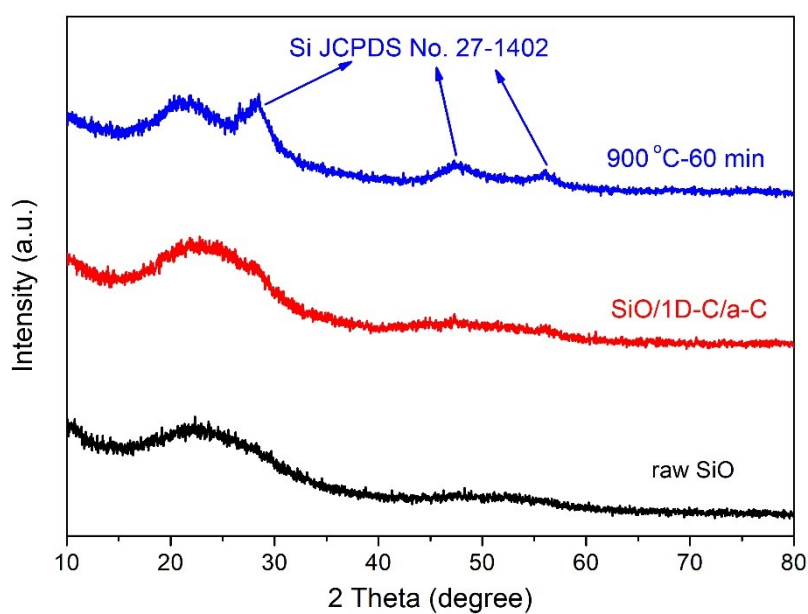


Fig. S6. XRD patterns of the raw SiO, the SiO/1D-C/a-C and the sample 900 °C-60 min.

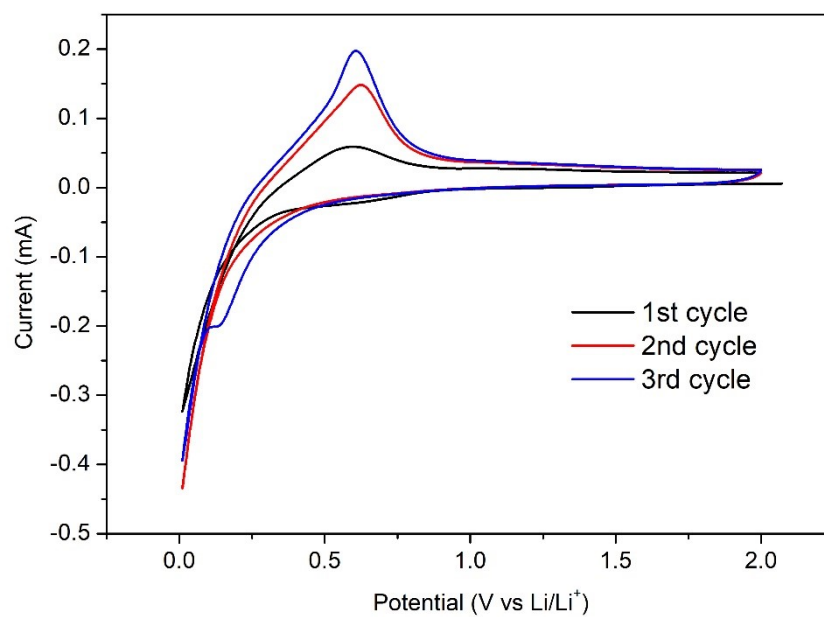


Fig. S7. CV curves of the raw SiO.

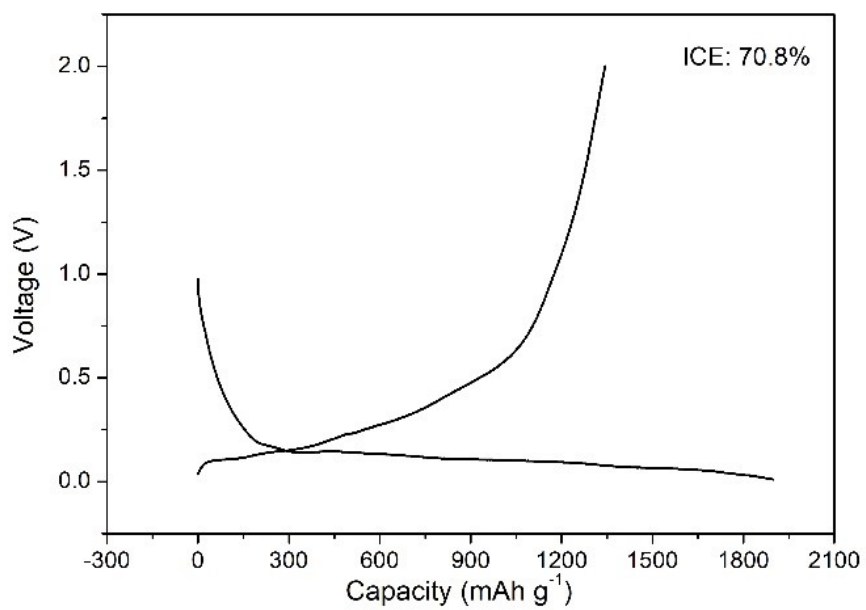


Fig. S8. Capacity-voltage curves of the raw SiO electrode.

Table S2. Carbon contents of sample different samples

Order	Sample	Carbon content (wt. %)	Cycle retention@150cyc (%)
1	500 °C-90 min (SiO/1D-C)	7.50	35.5
2	700 °C-20 min (Dual Coated-1)	12.92	60.2
3	700 °C-40 min (Dual Coated-2)	25.10	83.2
4	700 °C-60 min (Dual Coated-3)	35.31	72.6
5	900 °C-20 min (SiO/a-C)	22.42	61.1

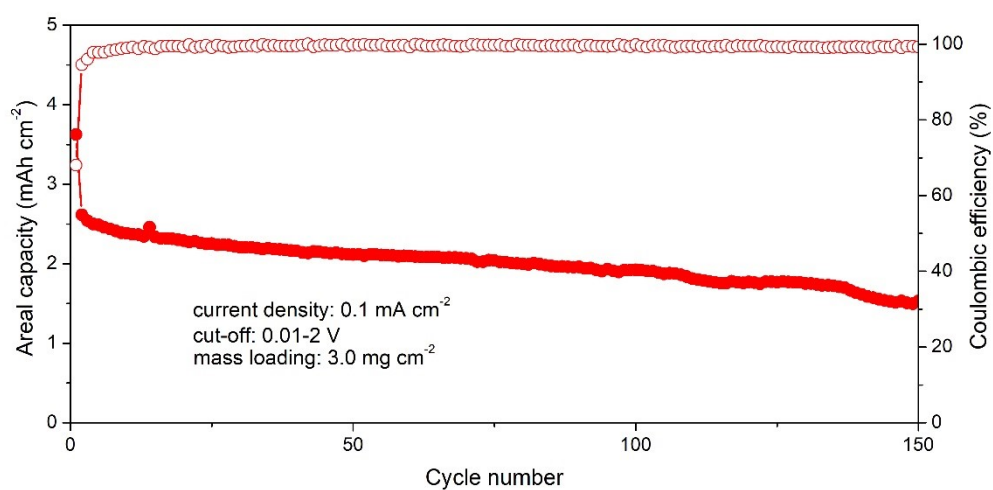


Fig. S9. Cycling performance of the SiO/1D-C/a-C electrodes with high mass loading.

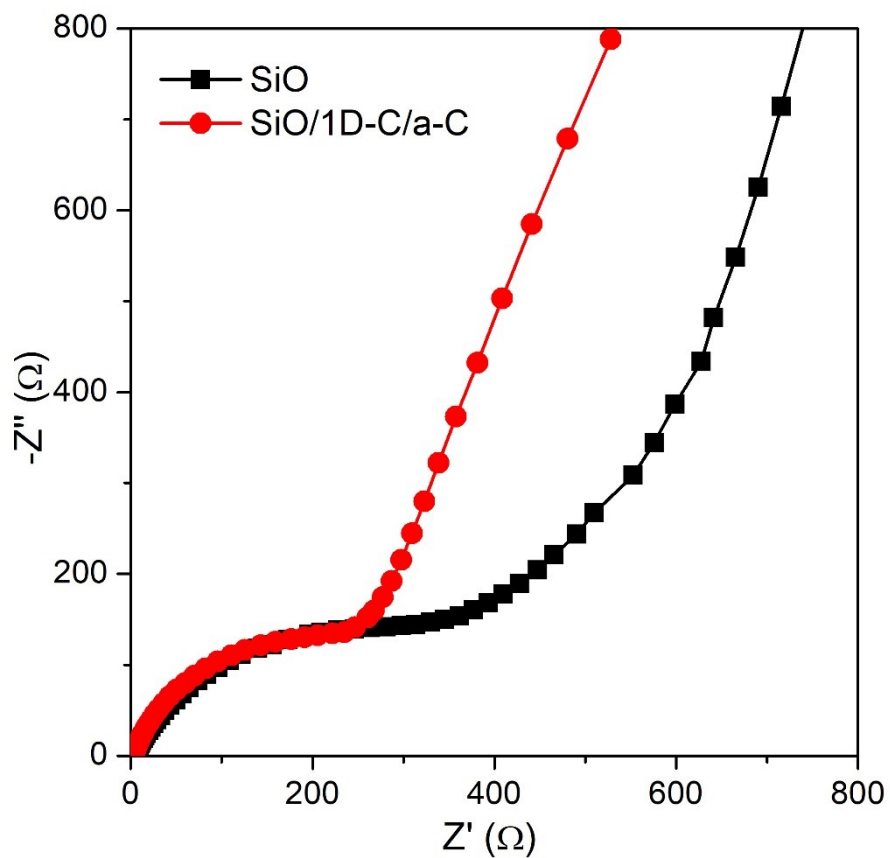


Fig. S10. EIS curves of the raw SiO and the SiO/1D-C/a-C electrodes in fresh stste.

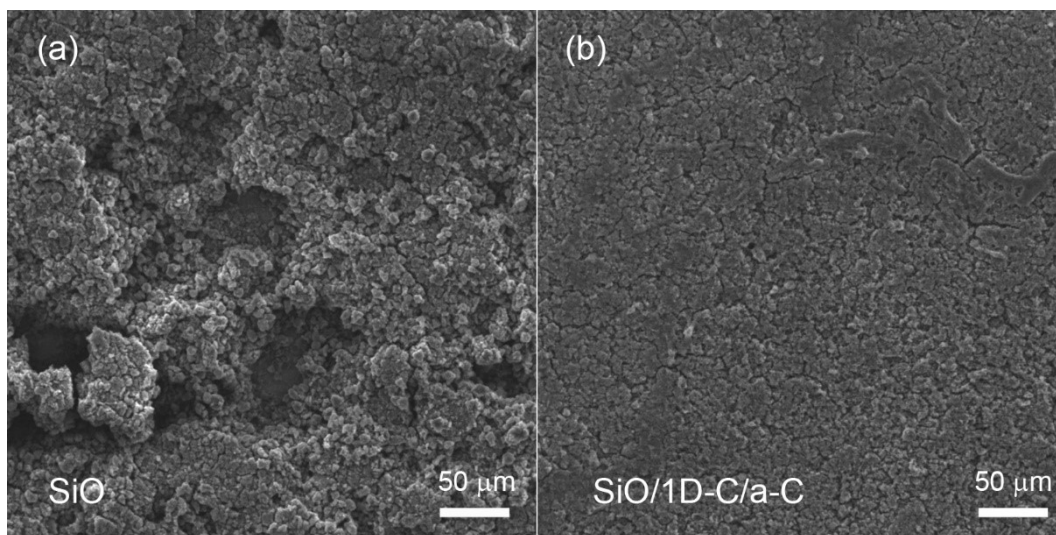


Fig. S11. SEM images of the surface morphology in the raw SiO (a) and SiO/1D-C/a-C (b) electrodes after 200 cycles.