**Fig. S1** The SEM image of Cu/carbon layers synthesized by thermolysis of pure copper citrate under a continuous argon/hydrogen gas (9:1/v:v) at 700 °C with a heating rate of 4 °C min$^{-1}$ and held at this temperature for 2 h.
The TGA result is accordance with the EDX result according to the following formula:

The increased weight ratio of composite after annealing in air

\[
= \frac{(\text{Cu} \times 16 + \text{Sb} \times 16 \times 3/2 - \text{C} \times 12)}{(\text{Cu} \times 64 + \text{Sb} \times 121 + \text{C} \times 12)}
\]

\= 20.22 \%