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## **Supplementary Information**

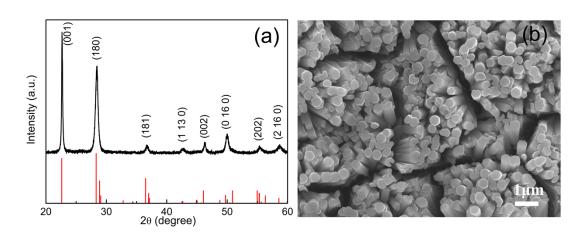
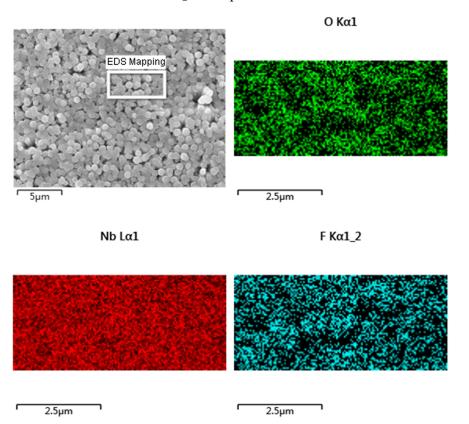


Fig.1S (a) XRD pattern and (b) SEM image of the samples synthesized by hydrothermal at 150 °C using 12.5M NH<sub>4</sub>F and 20ml  $\rm H_2O_2$  (30 wt.%) annealed at 500 °C in  $\rm O_2$  atmosphere for 1 hour.



**Fig. 2S** EDS mapping results of sample obtained at 150°C with NH<sub>4</sub>F concentration of 5.00 M and 20 ml H<sub>2</sub>O<sub>2</sub> (30wt.%)

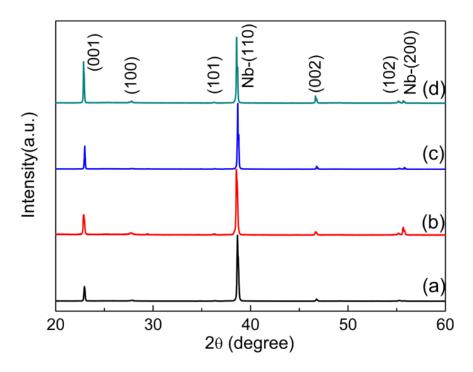


Fig. 3S XRD patterns of the  $Nb_2O_5$  nanorod arrays obtained by hydrothermal process at 150 °C for different reaction time. (a) 5h, (b) 10h, (c) 15h, (d) 20h.