## **Supporting Information for**

## Fabrication and Photoelectrochemical Property of Silicon/Nickel

## **Oxide Core/shell Nanowire Arrays**

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Fig. S2 TEM images of silicon/NiO<sub>x</sub> core/shell nanowire array fabricated by 2 min displacement reaction and thermal oxidation.

Fig. S3 Digital photo of silicon/NiO<sub>x</sub> core/shell nanowire wafer which fabricated by 2 min and 5 min displacement reaction, respectively. The photo is taken under incandescent.

Fig. S4 Selected area electron diffraction (SAED) of the nanoparticles on the nanowire.

**Fig. S5** (a) Typical GC trace of the evolved gas. (b) Digital image of the oxygen bubbles during the test.

Fig. S6 Cross section SEM image of silicon/NiO<sub>x</sub> core/shell nanowire photoanode after 48 h stability test.



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