

# Sub-20 nm Si/Ge superlattice nanowires by metal-assisted etching

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## Supporting Information

### A. Patterning the substrate by AAO templates

Before patterning, the Si substrates containing Si/Ge multilayers were precleaned by the standard RCA solution containing H<sub>2</sub>O<sub>2</sub> (30 wt.%), NH<sub>4</sub>OH (25%) and H<sub>2</sub>O at a volume ratio of 1:1:5. Afterwards, the Al deposition was performed by in a MSBA-400 (Malz & Schmidt

GbR Meißen) equipped with a high vacuum evaporation system electron beam evaporator (EV M-6 Ferrotec) at a power of 1.6 kW. Several  $\mu\text{m}$  of Al were deposited onto the substrates. The AAO template was fabricated by a two-step anodization. In the first anodization step, the substrates were anodized at 19 V in a 10 wt.% sulphuric acid at 1 °C. During this process, Al is oxidized and due to the surface roughness of the Al layer pores are formed in the AAO. Owing to the self ordering process, the pores arrange in a hexagonal order. In the second step, the complete Al layers was oxidized in 30 min and vertical pores are formed. In the case of the pores with a diameter of 50 nm, 0,3 wt.% oxalic acid at 40 V for 45 min was used.

## **B. Reactive ion etching**

The RIE procedure was carried out in a Plasmalab 100 (Oxford Instruments) using a gas flow of 85 sccm  $\text{SF}_6$ , 12 sccm  $\text{O}_2$  at a pressure of 9 mTorr for 70s.