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Self-assembled growth of Pt silicide nanowire on Si(100)

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We have studied the formation of Pt silicide nanowires on Si(100) using scanning tunneling microscopy. Pt silicide nanowires are grown on Si(100) by half-monolayer Pt deposition on the substrate at 550 °C and subsequent annealing. The nanowire formation is attributed to anisotropic lattice mismatches between Pt silicide and the bulk terminated Si. Pt silicide nanowires have widths of 2-3 nanometers and lengths up to a micrometer. The top surface of the nanowires may be composed of Pt dimer rows. The nanowires are found to be metallic by scanning tunneling spectroscopy.