

The thesis covers the preparation of a UHV system enabling low-temperature measurements by scanning tunneling microscope and the study of one-dimensional aluminium structures on the Si(100) 2×1 surface. Calibration measurements of deposition rate of Al from an evaporator, temperature of the silicon substrate during annealing and temperature of a cooling device during cooling have been carried out. A STM measurement has been carried out at the temperature of 60°C and aluminium chains on the silicon surface have been observed. Their lengths and forms have been analyzed and length distributions at various temperature have been created by using previously obtained data. The observed distributions have been discussed concerning the underlying physical processes.