

The subject of the thesis is growth of aluminium structures – one-dimensional chains – on Si(100) surface. Growth characteristics of Al on Si(100) at room temperature and at higher temperature and various coverages were measured using STM. The results are discussed with respect to previous experiments and a way to find the value of activation energy of surface migration is proposed. An important part of the thesis is preparation and tests of a new low-temperature UHV apparatus for STM experiments. Functions of the apparatus are described. A way to prepare clean Si(100) surface as well as the methods of achieving atomic-scale resolution in STM were found in conditions previously unknown. A test of evaporators for Al and Sn is described. Al deposition has not been successful in the new apparatus yet. Sn deposition has been successful and low-temperature structures of tin on Si(100) were observed. They differ from room-temperature structures and contain kinks which were previously observed only in Al structures.