

## Growth Kinetics of Ni adsorbates on Si(111)

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Growth of Ni adsorbate on Si(111)- $7\times 7$  surface was studied as a function of Ni coverage and annealing temperature using scanning tunneling microscope. Ni atoms adsorb as clusters near step edges, and remain disordered both after annealing at  $\sim 800\text{K}$  and  $\sim 1300\text{K}$  at submonolayer coverages. The disordered cluster island shows triangular shaped domain boundaries on the  $7\times 7$  surface. The island grows with 3 fold symmetry with increasing Ni coverage until the  $7\times 7$  surface disappears. After high temperature annealing, Ni/Si(111)- $\sqrt{19} \times \sqrt{19}$  R  $23.4^\circ$  (abbreviated  $\sqrt{19}$ ) structure can be observed under the cluster island. Phase boundaries between  $7\times 7$  and Ni induced  $\sqrt{19}$  structure are clearly observed. Dislocations which separate two  $\sqrt{19}$  structures are often observed and the growth model is proposed from the structure. As increasing Ni coverage, further, the disordered clusters on the  $\sqrt{19}$  structure disappear unexpectedly. Based on this observation a model for the growth kinetics is proposed.