

[22-S14]

STM Study of low coverage Pb on Si(100)-2x1

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We have investigated Pb adsorption on Si(100)-2x1 at RT and 78 K, using a low temperature Scanning Tunneling Microscope. At less than 0.5 ML coverage, we found 1-d chain structures in agreement with previous works. The structure of Pb chain has been interpreted as a simple Pb dimer chain on Si dimers. Our study, however, shows there exist two equally probable sites - hollow and top sites - for the initial adsorption of Pb on Si(100). Our study shows, furthermore, the evidence of surface etching by 640 K annealing and give an insight into an intermediate stage from (2x2) to c(4x8) at increased coverage. These and possibility of controlled migration of Pb on Si(100) will be discussed in detail.