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Studies of Cu adatom island ripening on Cu(100) by LEEM EZRA BUSSMANN, GARY L. KELLOGG, Sandia National Labs — Simple metal surfaces are model systems for characterizing kinetic processes governing the growth and stability of nanoscale structures. It is generally presumed that diffusive transport of adatoms across terraces determines the rate of these processes. However, STM studies in the temperature range T$\sim$330-420 K reveal that transport between step edges on the Cu(100) surface is limited by detachment barriers at the step edges, rather than by the adatom diffusion barrier.[1] This is because on the Cu(100) surface, mass transport is mediated primarily by vacancies, instead of adatoms. We have used low energy electron microscopy (LEEM) movies to characterize coarsening of Cu islands on the Cu(100) surface in the range T$\sim$460-560 K. By measuring the temperature dependence of the island decay rate we find an activation barrier of 0.9$\pm$0.1 eV. This value is comparable to the 0.80$\pm$0.03 eV barrier found in STM studies.[1]However, we are not able to conclude that transport is entirely detachment limited at these elevated temperatures. This work serves as background to establish whether or not Pd alloying in the Cu(100) surface will slow Cu surface transport. [2] 1. C. Klünker, *et al.*, PRB **58**, R7556 (1998). 2. M. L. Grant, *et al.*, PRL **86**, 4588 (2001). Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the U.S. DOE NNSA, Contract No. DE-AC04-94AL85000.

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