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One-dimensional Ostward ripening on island growth[1] F.K. MEN, A.L. CHIN, C.R. LEE, Department of Physics, National Chung Cheng University, Chia-Yi 621, Taiwan ROC — We have studied the growth of nano-scaled islands by post-annealing a Co-deposited Au/Si(111)-(5×2) surface of 0.3° miscut with scanning tunneling microscopy. At the early time of the growth, islands emerge randomly both on terraces and on top of step edges. Islands on steps then grow at the expense of those on terraces, most of which dissolve completely at later time. The island density and size dependences on the annealing time have been obtained and compared with a one-dimensional model based on the classical theory of diffusive decomposition. The agreement between the experiment and the theory leads to the conclusion that Ostwald ripening with steps acting as one-dimensional diffusive pathways for mass transfer governs the observed phenomenon.

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