

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

LEEM and STM observations of Growth of Nanowires of Ag on Ge(110) and Surface Structural Phases of Ir on Ge(111)¹ CORY MULLET, MARSHALL VAN ZIJLL, EMILIE HUFFMAN, SHIRLEY CHIANG, University of California, Davis — We have used both low energy electron microscopy (LEEM) and scanning tunneling microscopy (STM) to characterize the growth of silver on Ge(110) and iridium on Ge(111) as a function of coverage, deposition temperature, and annealing temperature. We observed 1D island growth along [-110] as Ag is deposited onto Ge(110) above 430 C. Island dimensions varied with deposition temperature. At 480 C, Ag islands are ~ 100 nm wide and 1-20 μ m long for 9 ML coverage. Between 380 C and 430 C, we observed two novel low coverage phases, with the higher coverage phase completing at 0.12 ML. Ir deposited onto the Ge(111) $c(2\times 8)$ above 400 C forms a $(\sqrt{3}\times\sqrt{3})R30^\circ$ phase, with island size dependent upon substrate temperature during deposition. Deposition at 400-425 C produces Ir islands, which are 1-20 nm in diameter at 0.5 ML coverage. Island heights range from one to several atomic layers, and exhibit a unique growth mode with islands connected by “streamers” of Ir. We observed Stranski-Krastanov growth in LEEM at 670 C. Ir desorbs from Ge(111) at 870 C, beginning from areas of high step density.

¹Funding from NSF CHE 0719504 and PHY-1004848

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Date submitted: 19 Nov 2010

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