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Growth of Iridium and Silver on Ge(111) and Ge(110) Studied by STM and LEEM[1] CORY MULLET, SHIRLEY CHIANG, JAMES MORAD, ALICE DURAND, UC Davis — We have used both scanning tunneling microscopy (STM) and low energy electron microscopy (LEEM) to characterize the growth of iridium and silver onto Ge(111) and Ge(110) as a function of coverage, deposition temperature, and annealing temperature. Ir deposited onto the Ge(111) c(2x8) surface forms a ($\sqrt{3}$x$\sqrt{3}$)R30^o phase, with island size dependent upon substrate temperature during deposition. Deposition at a sample temperature of 670 C yields μm-scale regions of continuous $\sqrt{3}$ coverage, as seen by LEEM. Deposition at 400 C produces Ir islands of three different sizes, all of which are too small to be resolved in LEEM but are easily observed in room temperature STM images. Heating the sample over 640 C yields larger islands observable with LEEM, with island size dependent upon annealing temperature. For Ag/Ge(111) below 1 ML, the 4x4 phase grows preferentially from step edges, while the $\sqrt{3}$ phase grows on terraces. Above 1 ML coverage, Ag forms multilayer islands that induce changes in the Ge(111) surface. Ag/Ge(110) forms 1D islands, $\sim$100nm wide, $\sim$10 μm long at 9 ML coverage.

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