Abstract Submitted
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LEEM Observations of Ag/Ge(111) Structural Phases and Phase Transformations[1] SHIRLEY CHIANG, CORY MULLET, University of California Davis — We use low energy electron microscopy (LEEM) to study the growth of, and transformations between structural phases of Ag deposited on Ge(111) above and below the Ag desorption temperature. Ag deposited on Ge(111) forms three main surface phases above 100 $^\circ$C: (4x4), ($\sqrt{3}$x$\sqrt{3}$)R30°, and (3x1). For deposition between 540-575 $^\circ$C, a (3x1) phase grows. Upon the completion of the growth of the (3x1) phase, a ($\sqrt{3}$x$\sqrt{3}$)R30° phase grows. For sufficiently high Ag deposition rates, we observed the same growth sequence above the Ag desorption temperature of 575 $^\circ$C , up to 640 $^\circ$C. Desorption above 575 $^\circ$C proceeds with the reverse sequence: the ($\sqrt{3}$x$\sqrt{3}$)R30° phase desorbs followed by desorption of the 3x1 phase. Above 640 $^\circ$C, we observed the growth of the (3x1) phase but not the ($\sqrt{3}$x$\sqrt{3}$)R30°. For 4x4 and ($\sqrt{3}$x$\sqrt{3}$)R30° surfaces prepared by deposition between 200-500 $^\circ$C we observe the transformation of these phases to a 1x1 disordered phase at the desorption temperature (575 $^\circ$C), with desorption proceeding from the edges of disordered 1x1 domains.

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