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Variation and effects of As_4 flux on morphology of InGaAs quantum dots E. ADDISON EVERETT, DONG JUN KIM, HAEYEON YANG, Utah State University, NANOPHOTONICS TEAM — We present a comprehensive *in-situ* scanning tunneling microscopy (STM) study of InGaAs quantum dots (QDs) on GaAs (001) substrates as a function of arsenic flux using molecular beam epitaxy (MBE). With all other MBE growth parameters fixed, changes in arsenic flux result in changes in the morphology of InGaAs QDs and the critical thickness to form 3D islands. Under arsenic-rich conditions, islands with flat tops are formed while reduced arsenic flux results in formation of islands with rounded tops. Decreasing numbers of InGaAs QDs result from increasing arsenic flux. Reflection high energy electron diffraction patterns taken before InGaAs deposition show that the surface reconstruction changes from a 2x4 to c4x4 with an increase of arsenic flux. STM imaging shows no dots with high As_4 flux, low density of dots with medium As_4 flux, and high density of dots with low As_4 flux, with a deposition amount of 7ML for all samples studied. Effects of arsenic flux on the changes in surface reconstruction surface morphology and density of QDs, and the critical thickness to form the self-assembled QDs will be discussed.

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