

Abstract Submitted  
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**Study on energetics of self-assembled quantum dot using molecular beam epitaxy and *in-situ* scanning tunneling microscopy** RICHARD WILSON, DONG JUN KIM, ADDISON EVERETT, HAEYEON YANG, Department of Physics, Utah State University — A chain of quantum dots were observed to form during an annealing process. Strained but flat InGaAs epilayers were grown on nominal (001) surfaces of GaAs substrate by molecular beam epitaxy (MBE) at low temperature below 400 ° C. Real-time reflection high energy electron diffraction observations suggest that the strained surfaces are crystalline during deposition processes. *In-situ* scanning tunneling microscope (STM) shows that the strained surfaces are atomically flat and the surface reconstruction are mixed with various structures. Upon heating the STM observed samples above 450 ° C under arsenic pressure, the strained layers undergo roughening transition, resulting in nanodots. The size and shape of dots depend on the annealing temperature and strain amount. Furthermore, the dots are aligned along straight lines, forming chains of dots.

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