

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

GaAs nanowires and GaAs/AlGaAs core/shell nanowires synthesized by MOCVD¹ BRIAN PETERS, NICHOLAS MINUTILLO, JOHN CARLIN, FENGYUAN YANG, The Ohio State University — Nanowires made by the “bottom-up” approach can be used in a variety of electrical and optoelectronic devices as well as in the study of low dimensional transport physics. We have grown GaAs nanowires using Au catalysts in a closed couple showerhead MOCVD system. A number of growth parameters, including the substrate temperature, growth rate, and Arsine/TMGa ratio, are explored to identify optimal conditions for growth of GaAs nanowires with large aspect ratio and minimal tapering. Higher substrate temperatures result in larger tapering and lower temperature leads to “kinks.” Meanwhile, large V/III source ratio gives large tapering as well. We have found that our optimal conditions are at a substrate temperature of 420 °C and V/III ratio of ~25, which gives a tapering of less than 1 nm increase in diameter per micron in length. In addition, GaAs/AlGaAs core/shell structured nanowires were also grown to minimize the surface states. Characterizations by SEM and photoluminescence will be presented.

¹This work is supported by Department of Energy (DE-SC0001304).

Fengyuan Yang
The Ohio State University

Date submitted: 19 Nov 2010

Electronic form version 1.4