

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Dual-surfactant effect on enhancing Zn-Doping of GaP<sup>1</sup>** JUNYI ZHU, GERALD STRINGFELLOW, FENG LIU — We report first-principles calculations demonstrating a dual-surfactant effect of Sb and H on enhancing Zn-doping in vapor phase epitaxially grown GaP thin films. The combined effects of Sb and H lower significantly the doping energy of Zn in GaP, while neither Sb nor H can work alone as effectively. The role of H is to provide the extra electron accommodating the p-type dopant incorporation to satisfy the electron counting rule. Our finding has an important general implication that p-type doping in III-V thin films can be achieved by chemical deposition with H, but difficult by physical deposition without H.

<sup>1</sup>This work is supported by the Department of Energy, Division of Basic Energy Sciences.

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Date submitted: 20 Nov 2006

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