

Atomic Structure of Indium-rich InP(001) Surface Imaged by NC-AFM

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Structure of indium-rich surface of InP(001) draws attention semiconductor community because it is different from (001) surfaces of other $A_{III}B_V$ compounds. In general, the most common A_{III} -element-rich reconstruction of $A_{III}B_V(001)$ surfaces is $4\times 2/c(8\times 2)$. In contrast, for InP(001) indium-rich 2×4 reconstruction is observed. Moreover, the presence of mixed dimers of indium and phosphorus or even phosphorus dimers is reported. Despite considerable effort undertaken to resolve the structure, it is still far from being completely understood. In this presentation, the results of NC-AFM investigation of 2×4 reconstructed InP(001) surface, prepared by ion sputtering and annealing, will be presented. Atomically resolved NC-AFM images will be discussed with respect to present structural models of the surface based predominantly on STM data. Mechanisms of contrast formation and contrast dependence on tip-apex composition will be discussed, similarly to the earlier work for $c(8\times 2)$ GaAs(001) and $c(8\times 2)$ InSb(001) surfaces [1].

[1] J.J. Kolodziej *et al.* Phys. Rev. Lett. 90 (2003) 226101.