
Strain induced superconductivity of Li intercalated bilayer Boron Phosphide by first principles study

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Abstract

Monolayer hexagonal Boron phosphide (BP) is a two dimensional narrow direct band gap semiconductor which has an ultra high carrier mobility [1]. Recent experimental and theoretical works show that Li intercalation can induce superconductivity of Black Phosphorous [2] and Graphene [3]. Using first principles calculation, we studied the strain induced superconductivity of Lithium intercalated bilayer BP. From electronic structure, lattice dynamic and electron-phonon coupling calculations, it is suggested that bilayer BP can transform from direct band gap semiconductor to phonon-mediated superconductor under Li intercalation [4]. The inference of tensile strain on superconductivity property of Li intercalated bilayer BP will also be presented. [1] M. Xie, S. Zhang, B. Cai, Z. Zhu, Y. Zou, and H. Zeng, *Nanoscale* 8, 13407 (2016).

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