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2D Materials Heterostructures: Electronic and Optical Properties

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Abstract

There are currently about a thousand of materials known to exist in the 2D form, and they offers a wide range of interesting electrical and optical properties [1]. Semiconductors have been at the heart of some of the most transformative device innovations over the course of the last 50 years, and research in two-dimensional (2D) atomic crystals has recently begun to focus on their heterostructures. Concomitantly, there are hundreds of different 2D materials and their permutations amount to numerous combinations of heterostructures. Certainly, theoretical exploration of these materials is needed to identify promising atomic heterostructures for device applications since depending on the field of usage, the requirements for heterostructures' band alignments change [2]. Here, I will discuss basic concepts on governing physics of their band alignments, and its implications on electrical [2], mechanical [3] and optical properties [4, 5].

Reference

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