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Recent development in 2D materials beyond graphene

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ABSTRACT

Discovery of graphene and its astonishing properties have given birth to a new class of materials known as “2D materials”. Motivated by the success of graphene, alternative layered and non-layered 2D materials have become the focus of intense research due to their unique physical and chemical properties. Origin of these properties ascribed to the dimensionality effect and modulation in their band structure. This review highlights the recent progress of the state-of-the-art research on synthesis, characterization and isolation of single and few layer nanosheets and their assembly. Electronic, magnetic, optical and mechanical properties of 2D materials have also been reviewed for their emerging applications in the area of catalysis, electronic, optoelectronic and spintronic devices; sensors, high performance electrodes and nanocomposites. Finally this review concludes with a future perspective to guide this fast evolving class of 2D materials in next generation materials science.

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