New two-dimensional crystals: controlled synthesis and optoelectronic devices

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Abstract
The unique structure and properties of two-dimensional (2D) crystals have a large impact on fundamental research as well as applications in electronics, photonics, optoelectronics and energy sciences. Here our recent studies on the controlled synthesis of new 2D crystals such as topological insulator V2VI3 nanostructures, other layered metal chalcogenides and their hybrid materials, as well as their optoelectronic properties will be discussed. We propose a method combined with micro-contact printing growth and van der Waals epitaxy to achieve the controlled growth of various 2D crystal arrays with well-aligned orientation, controlled thickness, and specific placement, which can be used for efficient photodetection applications. Our studies suggest that functional 2D crystals hold great promise for future electronic and optoelectronic applications.

References

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