frontiers in Materials

EDITORIAL
published: 01 February 2022
doi: 10.3389/fmats.2022.843290

Editorial: Electronic Properties, Vibrational Properties and Optical Properties of Van der Waals 2D Crystals

*Weiliang Wang**

School of Physics, Guangdong Province Key Laboratory of Display Material and Technology, Sun Yat-sen University, Guangzhou, China

Keywords: VdW, optical properties, electronic properties, 2D material, THz, Raman, heterostructure

Editorial on the Research Topic

Electronic Properties, Vibrational Properties and Optical Properties of Van der Waals 2D Crystals

Van der Waals (vdW) 2D-crystals exhibit superior physical and chemical properties originating from their unique two-dimensional laminate structure. Due to the anisotropic electronic structure and vibrational properties, they show the anisotropic electron and thermal transportation, and light absorption and scattering. They are strong candidates for future high-integration optoelectronic devices at micro and nano scale. This research topic holds original research and review articles on several topics of vdW 2D crystals including electronic properties, optical properties and applications.

Kumbhakar et al., overviewed the recent advances in optical properties and emerging applications of 2D Materials. Zhu et al., proposed a theoretical approach to design graphene cut-wires with maximized THz wave absorption and promoted their practical applications in THz functional devices. Wen et al., reported on chemical tuning of resonance coupling in heterostructures consisted of individual gold nanorods integrated with monolayer WS_2 and highlighted the potential of chemical treatment as an efficient technique for tailoring the interactions between plasmonic nanostructures and 2D semiconductors. Garcés et al., calculated the energy band structure and the optical absorption and reflectivity for each of the ultrathin 2D hexagonal materials MoS_2, MoP_2, NbS_2, and NbP_2. Yu et al., synthesized β-phase arsenic (β-As) bulk crystals and promoted the potential application of group-VA vdW 2D crystals in near-infrared ultrafast laser generation. Deng et al., quantitatively analyzed both the electrical resistivity and the inherent Fermi level of the as-grown monolayer *h*-BN flakes on the copper substrate, by the combined use of AFM (atomic force microscope) PeakForce Tunneling (PF-TUNA) mode and Kevin probe force microscopy (KPFM) model. Zhao et al., reported the influence of strain and interlayer shift on vibration responses in bulk and few-layer ferrovalley material GeSe in different polarization states (ferroelectric and antiferroelectric).

We would like to thank all contributing authors to the research topic, and the editorial staff of Frontiers in Materials for making this research topic possible.

Edited and reviewed by:
Bernardo Mendoza, Centro de Investigaciones en Optica, Mexico

***Correspondence:**
Weiliang Wang
wangwl2@mail.sysu.edu.cn

Specialty section:
This article was submitted to Thin Solid Films, a section of the journal Frontiers in Materials

Received: *25 December 2021*
Accepted: *13 January 2022*
Published: *01 February 2022*

Citation:
Wang W (2022) Editorial: Electronic Properties, Vibrational Properties and Optical Properties of Van der Waals 2D Crystals. Front. Mater. 9:843290. doi: 10.3389/fmats.2022.843290

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of Interest: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.