

Abstract Submitted
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hBN-encapsulated Group-VI TMDC van der Waals Heterostructures : Fabrication and Optical properties¹ MITSUHIRO OKADA, YUSUKE KUREISHI, SHOHEI HIGUCHI, Nagoya Univ., KENJI WATANABE, TAKASHI TANIGUCHI, National Institute for Materials Science, HISANORI SHINOHARA, RYO KITaura, Nagoya Univ. — Two-dimensional (2D) semiconductors, including MoS₂, WS₂, MoSe₂, etc., have provided a fascinating opportunity to explore optical properties in 2 dimensions. In particular, van der Waals (vdW) heterostructures composed of these 2D semiconductors, such as WS₂/MoS₂, offer a novel platform for optical physics, where strong inter-layer interaction drastically alters optical transitions. To explore the intrinsic properties of vdW heterostructures, high-quality samples are indispensable. Here, we report preparation and optical properties of high-quality vdW heterostructure (WS₂/MoS₂) which are fully encapsulated by hexagonal boron nitride (hBN). The hBN-encapsulated heterostructures were prepared through the polymer-assisted dry-transfer process, where control of the stacking angle was possible. Fabricated heterostructures show PL emissions not only from A-exciton peaks but also from interlayer excitons at 1.4-1.7 eV. The observed peaks from interlayer excitons can be decomposed into three peaks, which due to an ideal flatness of the hBN-encapsulated sample.

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