2D Heterostructures by Electrochemical Deposition

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Abstract

Growing heterostructure of 2D materials in a scalable fashion remains a major obstacle that needs to be overcome before these materials can make an impact in industries. Electrochemical deposition is a widely used technique in the semiconductor industry that can grow materials over wafer scales. In our group, we have been pushing the boundaries of the electrochemical deposition technique to offer an alternative solution for growing TMD heterostructures based on MoS_2, WS_2, WSe_2, and graphene. We will demonstrate a novel design of electrodes that allow 2D heterostructures to be electrochemically deposited in micro and nanostructures at large scales and over insulating materials, breaking the old tradition of depositing over conductors with this technique.

References

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[3] N. Abdelazim, Y. J. Noori, S. Thomas, et al., Wiley Adv. Electron. Mater., (2021) 2100419.
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Figures

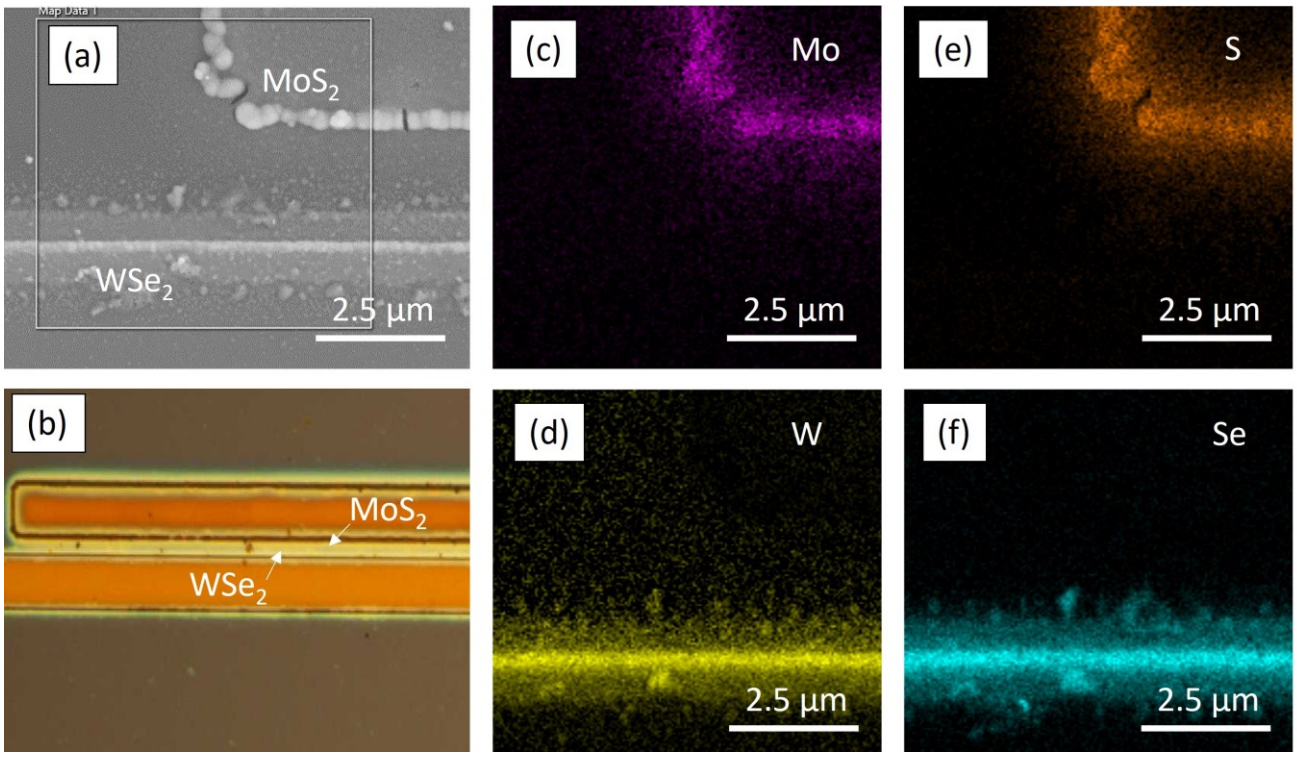

Figure 1: The lateral heterostructure of electrochemically deposited MoS2 and WSe2 as illustrated by an (a) SEM image (b) Optical microscope image and (c-f) EDX maps.