

Abstract

Variable Angle Spectroscopic Ellipsometry Characterization of Spin-Coated MoS₂ Films [†]

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Abstract: In the field of Transition Metal Dichalcogenides (TMDCs), molybdenum disulfide (MoS₂) has attracted an outstanding interest due to it having several applications. MoS₂ has potentialities not yet fully realized in solution-based applications. However, the lack of knowledge of the optical properties of MoS₂, especially in the infrared range, has significantly limited its use in many exciting photonic fields. In this work, the broadband optical properties of MoS₂ films deposited by spin-coating onto Si/SiO₂ substrates were studied by means of Variable Angle Spectroscopic Ellipsometry (VASE). The morphological and the structural properties of the samples were investigated by Scanning Electron Microscopy (SEM), Atomic Force Microscopy (AFM) and Micro-Raman Spectroscopy. Micro-Raman spectroscopy measurements reveal the presence of 2H-MoS₂ and 1T-MoS₂ phases. The optical properties of the films show a mid-gap state at 0.6 eV, not reported in an ellipsometry work before, induced by defects in the MoS₂ samples.

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