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Analysis of monolayer MoS2 films grown by CVD: Correlating RBS and SEM results through AES. EMANUEL BORCEAN, CHAD LUNCEFORD, JEFF DRUCKER, Arizona State University — Auger electron spectroscopy (AES), Rutherford backscattering spectrometry (RBS), and scanning electron microscopy (SEM) were used to quantitatively analyze MoS_2 films grown using chemical vapor deposition (CVD). A bulk MoS_2 standard is used to determine the peak height ratios of the Mo_{MNN} and S_{LMM} Auger transitions for stoichiometric MoS_2. This result is employed to assess the stoichiometry of the CVD-grown films. This analysis is valid since the energies and thus mean free paths of the Mo_{MNN} and S_{LMM} Auger electrons are nearly the same. The Mo_{MNN} Auger peak height is calibrated using RBS so that the Mo coverage can be quantified along the sample to assess its uniformity. By assuming that the islands observed in SEM are stoichiometric MoS_2, it is also possible to quantify the S Auger signal along the substrate. These results are being analyzed to determine whether they can resolve the discrepancy between the Mo coverage measured using RBS and the fraction of substrate area covered by MoS_2 islands observed in SEM images.

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