

Abstract Submitted  
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**Characterization of large area molybdenum disulphide by low energy electron microscopy** K.L. MAN, Okinawa Inst of Sci & Tech, H. YAMAGUCHI, Los Alamos National Laboratory, S. NAJMAEI, S. LEI, P.M. AJAYAN, J. LOU, Rice University, G. GUPTA, A.D. MOHITE, Los Alamos National Laboratory, K.M. DANI, Okinawa Institute of Science and Technology Graduate University — Molybdenum disulphide ( $\text{MoS}_2$ ) is a new 2D direct-bandgap semiconductor material which has recently attracted substantial interest due to its potential applications in electronics, optics and energy storage. One of the challenges that needed to be overcome is in the large scale synthesis of high quality single crystal  $\text{MoS}_2$ . Recently, it is shown that chemical vapor deposition (CVD) is a promising way of in the production of single layer  $\text{MoS}_2$ . Here we report our study using low energy electron microscopy (LEEM) of large area  $\text{MoS}_2$  synthesized by CVD technique. The  $\text{MoS}_2$  samples are grown on Si/ $\text{SiO}_2$  substrates and then transferred onto n-doped Si substrates. In the LEEM images, we observe large triangular shaped  $\text{MoS}_2$  flakes along with irregular shaped flakes. Using low energy electron diffraction (LEED) and dark field imaging technique, we identify the triangularly shaped flakes as  $\text{MoS}_2$  single crystal while the irregular ones contain multiple domains orientations. These studies provide insight into the growth of large area single domain  $\text{MoS}_2$  crystals using CVD technique and the transfer process onto different substrates for potential device applications.

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