Abstract Submitted
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Large Area Synthesis of WS_2 Crystalline Sheets Directly on SiO_2 and Their Transfer to Other Substrates ANA LAURA ELIAS, NESTOR PEREA-LOPEZ, The Pennsylvania State University, ANDRES CASTRO-BELTRAN, Universidad Autonoma de Nuevo Leon, AYSE BERKDEMIR, SIMIN FENG, RUITAO LV, AARON LONG, The Pennsylvania State University, TAKUYA HAYASHI, YOONG AHM KIM, MORINOBU ENDO, Shinshu University, HUMBERTO R. GUTIERREZ, University of Louisville, SUJOY GHOSH, SAIKAT TALAPATRA, Southern Illinois University Carbondale, NIHAR R. PRADHAN, LUIS BALICAS, Florida State University, FLORENTINO LOPEZ-URIAS[1], HUMBERTO TERRONES, MAURICIO TERRONES[2], The Pennsylvania State University — Metal dichalcogenides (e.g. MoS_2, WS_2, NbS_2) have attracted attention because they are layered materials that could exhibit either semiconducting or metallic properties. These properties could be significantly modified when these materials become monolayers. Here we report for the first time the synthesis of large area few-layer WS_2 by a two step method. WO_x thin films were first grown on a Si/SiO_2 substrate and these films were sulfurized in a second step. Furthermore, we have developed an efficient route to transfer these WS_2 films onto different substrates. WS_2 films of different thicknesses have been analyzed by Raman spectroscopy, HRTEM and AFM. Characterization techniques demonstrate the presence of mono-, bi- and few-layered WS_2 in the as-grown samples. The novel photoluminescence properties of the films will also be discussed.

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