Atomic Layer Deposition of MoS_2 film

Lee Kheng Tan,‡[ab] Bo Liu,‡[c] Jing Hua Teng,[b] Shifeng Guo,[b] Hong Yee Low,[d] and Kian Ping Loh*[a]

[a] *Department of Chemistry and Graphene Research Centre, National University of Singapore, 3 Science Drive 3, Singapore 117543*

[b] *A*STAR, Institute of Materials Research and Engineering, 3 Research Link, Singapore 117602*

[c] *Department of Physics and Graphene Research Centre, National University of Singapore 2 Science Drive 3, Singapore 117551*

[d] *Singapore University of Technology and Design, 20 Dover Dr, Singapore 138682*

‡*These authors contributed equally.*

Figure S1. AFM morphological images for MoS_2 film deposited by 5 and 10 ALD cycles.

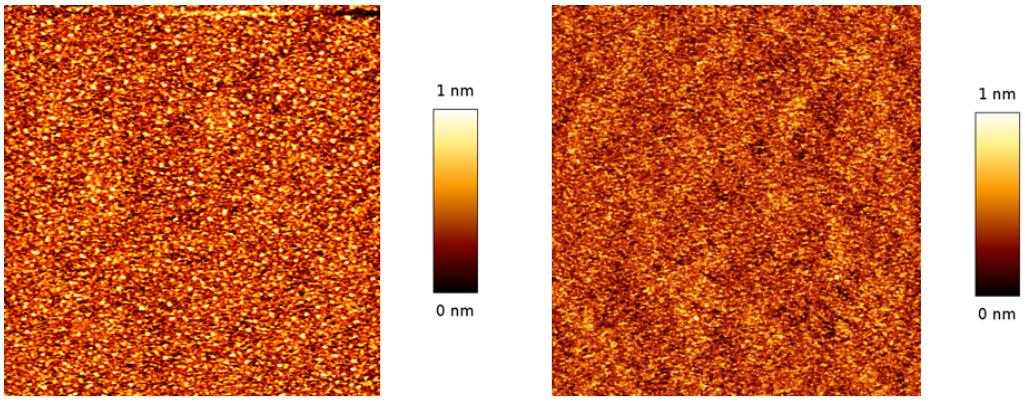

Figure S2. TEM image of MoS_2 film deposited by 10 ALD cycles on sapphire substrate. It depicts a continuous MoS_2 film of ~1.7 nm thickness on the substrate.

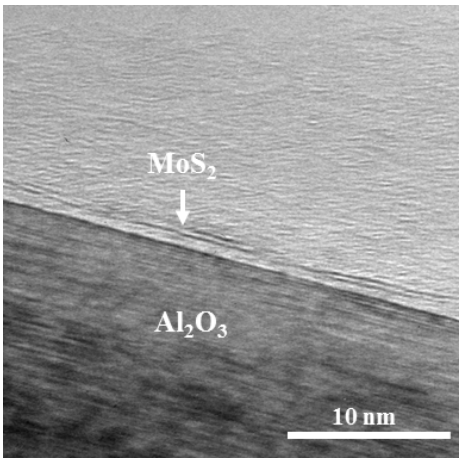

Figure S3. PL spectrum of annealed, 10 and 20 ALD cycles-deposited MoS_2 film transferred on SiO_2/Si substrate. It shows similar optical characteristics as MoS_2 film on sapphire. PL spectrum of a typical CVD grown sample is also included as a reference.

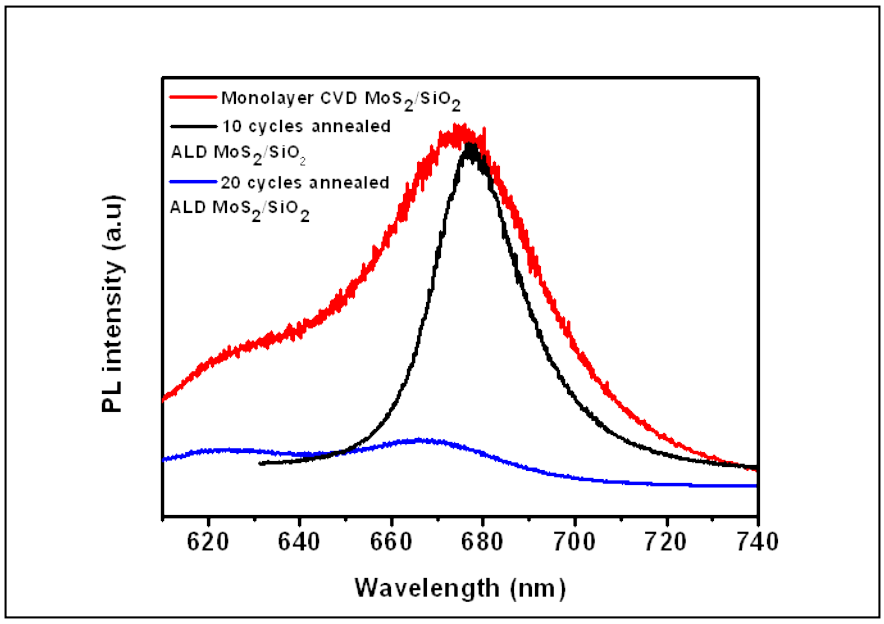

Figure S4. Relationship between the number of ALD cycles and thickness of MoS_2 film, as measured by AFM and TEM.

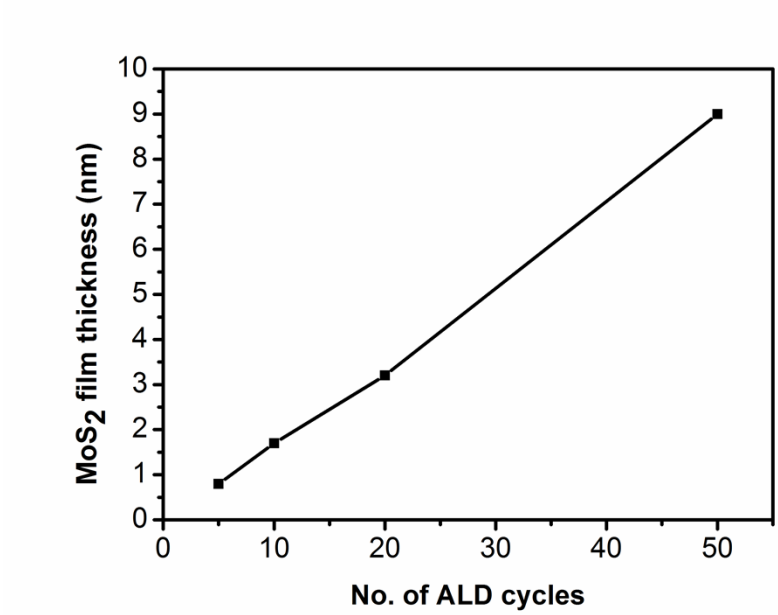

Figure S5. AFM images and height profile for 20 ALD-cycle deposited MoS_2 film cycles after annealing.