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Surface wettability modification of CVD-grown MoS_2 by oxygen plasma treatment HYUKJOON KWON, SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan Univ, YUNJEONG PARK, Department of Mechanical Engineering, Sungkyunkwan Univ, YOUNGCHAN KIM, SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan Univ, CHANGGU LEE, KYUNGHOON KIM, Department of Mechanical Engineering, Sungkyunkwan Univ — Two dimensional MoS_2 FET (field-effect transistor) has been emerging as an outstanding semiconductor device platform for bio-sensor. MoS_2 FET has not only a good stability in electrolyte and pH changes but also tunability for surface engineering, which provides a good opportunity for bio-sensor platforms. Recently many studies have been reported on electronic and optical properties of MoS_2 while less effort has been made to investigate the surface wettability of CVD-grown MoS_2 and modification of atomically layered MoS_2 surface property. In this study, we investigated the surface energy of MoS_2 with various layer thickness (1L, 2L and 3L) and effect of O_2 plasma treatment. We synthesized mono- to tri-layer of large-area MoS_2 with CVD (chemical vapor deposition) method and conducted surface characterization of MoS_2 supported on SiO_2/Si substrate using atomic force microscopy and contact angle measurement. We show tunable wetting properties of plasma-engineered MoS_2.

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