Atomic Structure and Spectroscopy of Single Metal (Cr, V) Substitutional Dopants in Monolayer MoS_2

Alex W. Robertson,[1] Yung-Chang Lin,[2] Shanshan Wang,[1] Hidetaka Sawada,[1,3,4] Christopher S. Allen,[1,4] Qu Chen,[1] Sungwoo Lee,[5] Gun-Do Lee,[5] Joohee Lee,[5] Seungwu Han,[5] Euijoon Yoon,[5] Angus I. Kirkland,[1,4] Heeyeon Kim,[6] Kazu Suenaga,[2] and Jamie H. Warner[1*]*

[1]Department of Materials, University of Oxford, Parks Road, Oxford, OX1 3PH, United Kingdom

[2]Nanotube Research Center, National Institute of Advanced Industrial Science and Technology (AIST), AIST Central 5, Tsukuba 305-8564, Japan.

[3]JEOL Ltd., 3-1-2 Musashino, Akishima, Tokyo 196-8558, Japan

[4]ePSIC, Diamond Light Source Ltd, Didcot, Oxfordshire, OX11 0DE, United Kingdom

[5]Department of Materials Science and Engineering, Seoul National University, Seoul 151-742, Korea

[6]Convergence Materials Laboratory, Korea Institute of Energy Research, 152 Gajeong-ro, Yuseong-gu, Daejeon 305-343, Korea

*alex.robertson2@materials.ox.ac.uk; jamie.warner@materials.ox.ac.uk;

Supporting Information

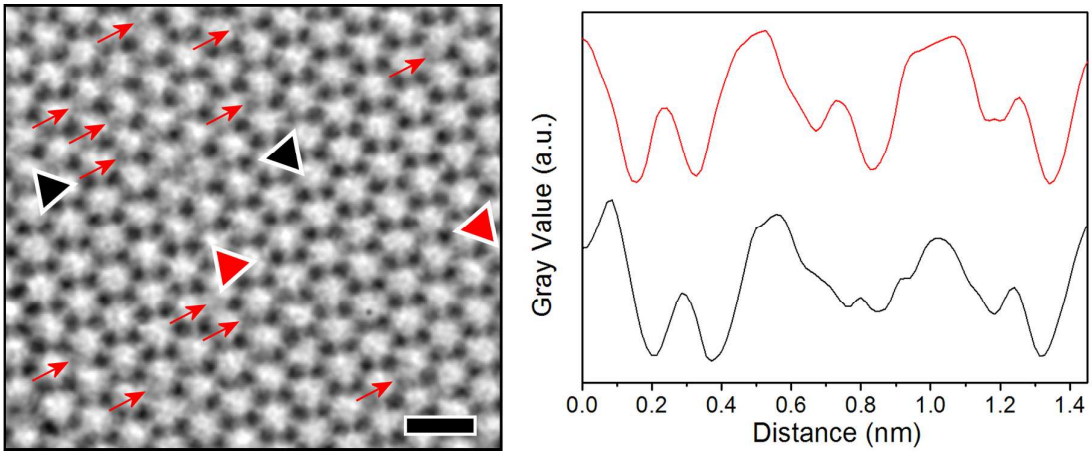

Figure S1. AC-TEM image of monolayer CVD MoS_2 with intensity line profiles taken from the respectively colored pointers. Profiles are of an S@Mo or Cr@Mo (black line profile), and two

adjacent S vacancies for reference (red line profile). Red arrows indicate some other S vacancy sites. Scale bar 0.5 nm.