Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Binding Structures of Diatomic Molecules to Co-Porphyrins on Au(111) Studied by Scanning Tunneling Microscopy SOON-HYEONG LEE, Department of Physics, Korea University, YUN HEE CHANG, Graduate School of Nanoscience and Technology (WCU), KAIST, HOWON KIM, WON JUN JANG, Department of Physics, Korea University, YONG-HYUN KIM, Graduate School of Nanoscience and Technology (WCU), KAIST, SE-JONG KAHNG, Department of Physics, Korea University, DEPARTMENT OF PHYSICS, KOREA UNIVERSITY COLLABORATION, GRADUATE SCHOOL OF NANOSCIENCE AND TECHNOLOGY (WCU), KAIST COLLABORATION — Axial bindings of diatomic molecules to metalloporphyrins involve in the dynamic processes of biological functions such as respiration, neurotransmission, and photosynthesis. The binding reactions are also useful in sensor applications and to control molecular spins in metalloporphyrins for spintronic applications. Here, we present the binding structures of diatomic molecules to surface-supported Co-porphyrins studied using scanning tunneling microscopy. Upon gas exposure, three-lobed structures of Co-porphyrins transformed to bright ring shapes on Au(111), whereas H2-porphyrins of dark rings remained intact. The bright rings are explained by the structures of reaction complexes where a diatomic ligand, tilted away from the axis normal to the porphyrin plane, is under precession. Our results are consistent with previous bulk experiments using X-ray diffraction and nuclear magnetic resonance spectroscopy.

Soon-hyeong Lee
Department of Physics, Korea University

Date submitted: 08 Feb 2013 Electronic form version 1.4