

X-ray adsorption studies of the effect of gas environment on a highly dispersed iridium catalyst

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NG 10 X-ray Absorption Studies of the Effects of Gas Environment on a Highly Dispersed Iridium Catalyst.

D.C. KONINGSBERGER*, D.E. SAYERS†, North Carolina State University. X-ray absorption studies (XANES, EXAFS) have been carried out on a highly dispersed 0.8 wt% Ir/Al₂O₃ catalyst at beamline X-11A of the National Synchrotron Light Source (NSLS), under the following conditions: 1) under H₂ after reduction at 473K to study the structure of the reduced metal particles and its interaction with the support; 2) after evacuation at 623K in order to remove the chemisorbed hydrogen and to follow the change in morphology of the metal particle in vacuum; and, 3) after exposure to O₂ at low temperature to study the physisorption of O₂ on the surface of the metal particle. Contraction of the metal-metal coordination distance is observed together with a change in morphology after removal of the chemisorbed hydrogen in vacuum. The O₂ physisorption changes the low-k part of the EXAFS spectrum consistent with oxygen neighboring atoms on the surface of the metal particle.

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