

Abstract Submitted
for the 4CF15 Meeting of
The American Physical Society

In situ Observation of Ag Nanoparticles Catalyzed Oxidation of Carbon Nanotubes in an Aberration-corrected Environmental TEM¹ DA-TONG YUCHI, YONGHAI YUE, JINGYUE LIU, Arizona State University — The emission of soot or particulate matter formed during combustion of carbonaceous fuels is the major source of air pollution. Catalytic oxidation of soot in the exhaust gas is critical to reducing the negative environmental impact of power sources. The fundamental understanding of metal nanoparticle catalyzed oxidation processes of carbon materials is of interest. We report here the *in situ* investigation of Ag nanoparticle catalyzed oxidation of multi-wall carbon nanotubes (MW-CNTs) inside an aberration-corrected environmental TEM with the goal of probing the nature of the active sites, the catalytic processes and the atomic scale structural evolutions of the Ag nanoparticles and the MW-CNTs. It was found that the Ag nanoparticles initiated the oxidation of MW-CNTs at a temperature of about 250 C while without the use of Ag nanoparticle the MW-CNTs did not oxidize until well above 500 C. Atomic scale information on the Ag nanoparticle catalyzed oxidation processes of MW-CNTs has been obtained and a model for the catalytic oxidation process was proposed.

¹Supported by the College of Liberal Arts and Sciences of Arizona State University

Jingyue Liu
Arizona State University

Date submitted: 11 Sep 2015

Electronic form version 1.4