

Abstract Submitted
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UV-Ozone Oxidation of ultra thin Ru layers¹ CHANGDUK LIM, VAISHALI UKIRDE, Dept. of Materials Science, University of North Texas, OLIVER CHYAN, Dept. of Chemistry, University of North Texas, MOHAMED EL BOUANANI, LABORATORY FOR ELECTRONIC MATERIALS AND DEVICES, DEPARTMENT OF MATERIAL SCIENCE & ENGINEERING TEAM — Ruthenium and its oxides and nitrides are potential candidates for number of advanced applications in Silicon based semiconductor technology such as metal-based gate electrodes and diffusion barriers for copper interconnects. This is due to their good thermal stability, low resistivity, suitable work function and diffusion barrier properties. Physico-chemical and electrical properties of Ru oxides are intimately dependent on the oxide preparation method mainly due to the resulting microstructure, oxidation state and impurities/contaminants. 5 to 7 nm Ru films were deposited on Si and SiO₂ substrates by DC magnetron sputtering in Ar atmosphere. The films were then exposed to UV/Ozone radiation and oxygen at room temperature for a duration ranging from 15 min to 60 min. In-situ X-ray photoelectron spectroscopy (XPS) is used to investigate Ru oxidation rate and the bonding environment. A comparison with Ru oxide prepared via reactive DC sputtering in an Ar/O₂ mixture will be presented.

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