# Evaluation of copper oxides dissolution in aqueous solution

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Recently, the copper interconnection with the damascene structure has been employed to overcome the serious RC delay and metal migration issues in the semiconductor devices. Unfortunately, copper does not form a stable surface oxide layer. The use of copper introduces materials processing concerns, such as oxidation, which can negatively impact component performance and reliability. Cleaning chemistries need to exhibit a high degree of selectivity in removing copper oxide over the underlying copper and on dielectric sidewalls. In this study, the aqueous solutions have been evaluated for the copper oxides removal. The dissolution characteristics of aqueous solutions were measured as the solubility of copper oxides and metallic copper. The surface roughness and the oxidation status of electroplated copper film were analyzed by atomic force microscopy (AFM) and X-ray photoemission spectroscopy (XPS), respectively.