Post-Copper CMP Cleaning Challenges Beyond 45 nm – A Novel Approach

As critical dimensions and tolerances regarding killer particle defects become more stringent, the demand for high-performance PCMP processing is increasing in leading-edge semiconductor manufacture. Additional challenges for interconnect PCMP include removal of organic layers on Cu as well as compatibility with dielectric materials of increasing porosity and chemical sensitivity. While traditional approaches to Cu PCMP have relied on extremes of pH to assist in particles removal and metal surface preparation, it would be advantageous for a variety of reasons to conduct Cu PCMP processing under more neutral conditions. This work summarizes the interesting positive results demonstrated by a Cu PCMP chemical and process conducted at close to neutral conditions.