Characterization of CMP Slurries by Filtration and other Methods

Jing Wang and David Y.H. Pui

Particle Technology Lab, Department of Mechanical Engineering, University of Minnesota, 111 Church St. SE, Room 1100 ME, Minneapolis, MN 55455,
Tel: 612-226-0979 E-mail: wangj@aem.umn.edu

ABSTRACT

The specifications for chemical mechanical polishing (CMP) processes are becoming more complex and demanding as the semiconductor industry calls for improved planarity and lower defect levels on larger wafers. We use different methods, including filtration to characterize the particles in CMP slurries. In the filtration experiments, the slurries were filtered by membrane filters with different pore sizes and the retention was measured. Assuming a log-normal distribution of the particle size in the slurries, we can compute the particle size distribution based on the retention values. The results did not agree with measurements using other instruments based on light scattering and electrokinetic sonic amplitude methods. However, it is found that the filtration results can be correlated with the turbidity in the CMP slurries.