POLISHING COMPOSITIONS AND METHODS FOR SELECTIVELY POLISHING SILICON NITRIDE OVER SILICON OXIDE FILMS

ABSTRACT

Stable aqueous polishing compositions that can selectively polish silicon nitride (SiN) films and nearly stop (or polish at very low rates) on silicon oxide films are provided herein. The compositions comprise an anionic abrasive, a nitride removal rate enhancer containing a carboxyl or carboxylate group, water, and optionally, an anionic polymer. The synergistic combination of anionic (negatively charged) abrasives and the nitride removal rate enhancer provide beneficial charge interactions with the dielectric films during CMP, a high SiN rate and selectivity enhancement (over oxide), and stable colloidal dispersed slurries.

[Figure 2]