

## A Study on Polyelectrolyte at Ceria-water interface for STI CMP

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CMP process is one of important steps in semiconductor fabrication. Particularly, CMP slurry is the most important consumable, which is composed of colloidal abrasives and various chemical additives. In this study, we investigated the effects of highly selective ceria slurry on shallow trench isolation (STI) CMP. Specifically, adsorption characteristics and chain conformation of polymer additives at ceria-water interface were studied to correlate colloidal behavior of CMP slurry with polishing properties such as material removal rate and selectivity of silicon oxide over silicon nitride. Interactions of polymer additives and ceria abrasives were examined in terms of pH, salt concentration, and types of salts to interpret the performance of STI CMP process. The effects of chain conformation of polyelectrolytes adsorbed onto the ceria slurry were investigated by using fluorescence spectroscopy, static contact angle measurement and zeta potential analysis. To do this, we have conducted CMP tests on thin films of silicon oxide and silicon nitride. Keywords: Ceria slurry, Anionic polyelectrolyte, Adsorption characteristic, Polymer conformation, STI CMP.