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(54) Title: CHEMICAL MECHANICAL PLANARIZATION FOR SHALLOW TRENCH ISOLATION

(57) Abstract: Present invention provides Chemical Mechanical Planarization Polishing (CMP) compositions for Shallow Trench Isolation (STI) applications. The CMP compositions contain ceria coated inorganic oxide particles as abrasives, such as ceria-coated silica particles or any other ceria-coated inorganic oxide particles as core particles; non-ionic organic alcohol compound having at least two hydroxyl groups bearing on the same molecule, chemical additives having at least one or at least two carboxylic functional groups and at least two hydroxyl groups on the same molecule. And optionally biocide and pH adjuster are used in the STI polishing compositions; wherein the compositions have a pH of 2 to 12, preferably 3 to 11, more preferably 4 to 10 and most preferably 5 to 9. The disclosed STI polishing compositions provide low erosions on various density features of the polished STI patterned wafers.