Method For Reducing Dishing In Chemical Mechanical Polishing

Abstract

A method is described for reducing dishing in a chemical mechanical polishing process performed on a semiconductor wafer having a dielectric layer with trenches and a copper layer deposited over the dielectric layer and filling the trenches in the dielectric layer. The method comprises steps of removing excess copper above the plane of the dielectric surface using a main polishing operation, whereby copper residues are formed above the plane of the dielectric surface, and applying chemical treatment to the surface of the semiconductor wafer in the initial stage of an overpolishing operation, wherein a protective layer over the copper residues and surfaces of copper-filled trenches is formed. The method further comprises steps of removing the copper residues and protective layer thereon above the plane of the dielectric layer in the overpolishing operation, and removing the protective layer over the surfaces of the copper-filled trenches in the overpolishing operation.

Figure 5