POLISHING METHOD WITH INERT GAS INJECTION

ABSTRACT

A polishing process in a semiconductor device fabrication process employs a polishing composition in which a gaseous phase is created within the polishing composition. During a polishing process, the gaseous phase dynamically responds to changes in the surface profile of the material undergoing removal by chemical and abrasive action during polishing. The inert gas bubble density dynamically increases in proximity to surface region of the substrate being polished that are prone to dishing and erosion. The increased inert gas bubble density operates to reduce the polish removal rate relative to other regions of the substrate. The dynamic action of the gaseous phase within the polishing composition functions to selectively reduce the localized polish removal rate such that a uniformly smooth and flat polished surface is obtained that is independent of the influence of pattern density during the polishing process.

Figure 3