SUMMARY OF THE INVENTION

[0008] The presently claimed and disclosed inventive concept(s) relate to a semiconductor processing composition and method for cleaning a semiconductor wafer or related other substrate post chemical mechanical polishing. The composition comprises at least one phosphorous containing base and, optionally, at least one surfactant.

[0009] Embraced within the claimed and disclosed inventive concepts giving rise to the invention is an improved nitrogen-free semiconductor processing composition which comprises at least one phosphorous containing base and that may optionally contain one or more other components selected from a phoshonic acid and/or a surfactant, e.g., nonionic, cationic, anionic.

[0010] The processing composition of the invention is particularly well suited for post-CMP cleaning (i.e., post chemical mechanical polishing) to remove CMP residue from the surface of an object to be cleaned, e.g., from the surface of a semiconductor wafer. Accordingly, within the presently claimed and disclosed inventive concept(s) is a method of post-CMP cleaning to remove a CMP residue from a surface of an object comprising the steps of: (a) forming a nitrogen-free processing composition comprising at least one phosphorous containing base; and (b) contacting the surface of the object with the processing composition whereby a primary, i.e., material, portion of the CMP residue is removed from the surface of the object.

[0010a] Thus, one aspect of the invention relates to a post CMP cleaning composition which is free of nitrogen atoms and comprises at least one phosphorous base.

[0010b] Another aspect relates to a method for cleaning a semiconductor wafer post chemical mechanical polishing to remove CMP residue from the wafer surface comprising the steps of: (a) forming a processing composition comprising: at least one phosphorous containing base; and optionally at least one surfactant, and (b) contacting the surface of said wafer with the processing composition whereby at least portion of the CMP residue is removed from the surface of the object.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Figs. 1, 2 and 3 are graphs of total defect counts corresponding to experimental formulations A through O in the Examples which follow.

DETAILED DESCRIPTION OF THE INVENTION

[0012] The presently claimed and disclosed inventive concept(s) relate to and define an