k dielectric materials of the semiconductor substrates, gives a high quality surface finish, decreases dishing, is storage stable and would be ready-to-use in neutral to alkaline pH range. Furthermore, a respective CMP process was to be provided.

Accordingly, in an aspect, a CMP composition was found which comprises

(A) colloidal or fumed inorganic particles (A) or a mixture thereof in a total amount of from 0.0001 to 2.5 wt.-% based on the total weight of the respective CMP composition
(B) at least one amino acid in a total amount of from 0,2 to 1 wt.-% based on the total weight of the respective CMP composition
(C) at least one corrosion inhibitor in a total amount of from 0,001 to 0,02 wt.-% based on the total weight of the respective CMP composition
(D) hydrogen peroxide as oxidizing agent in a total amount of from 0.0001 to 2 wt.-% based on the total amount of the respective CMP composition
(E) water

wherein the CMP composition (Q) has a pH in the range of from 6 to 9.5.

In addition, in a further aspect, there is provided a process for the manufacture of a semiconductor device comprising the chemical mechanical polishing of a substrate comprising a surface region containing or consisting of cobalt or cobalt and copper and/or of a cobalt alloy in the presence of said chemical mechanical polishing (CMP) composition (Q).

Moreover, in a further aspect, there is provided the use of said CMP composition (Q) for chemical mechanical polishing of a substrate (S) used in the semiconductor industry, wherein the substrate (S) comprises (i) cobalt or (ii) cobalt and copper and /or (iii) a cobalt alloy.

Surprisingly, it could be found that the CMP composition (Q) according to the disclosure is showing an exceptional dependence of the copper material removing rate on the hydrogen peroxide concentration and therewith gives the opportunity to adjust the selectivity of cobalt to copper by varying the H_2O_2 concentration. Without being bound to this theory it is presently believed that this is due to the combination of a low abrasive concentration below 2.5 wt.% and a pH in the range of from 6 to 9.5.

Preferred embodiments are explained in the claims and the specification. It is understood that combinations of preferred embodiments are within the scope of the present disclosure.

According to the invention, the CMP composition comprises colloidal or fumed inorganic particles or a mixture thereof (A).