purity Cu. Addition of La<0.002wt%, Ce<0.003wt%, Ca<0.004wt% to a 4N Cu wire revealed a long storage life.

Generally, alloyed Cu wires are in demand with good bondability, free air ball formation in an inert or reactive environment, reliability, in particular under highly accelerated stress test (HAST), good looping performance and easy to wire draw in mass production scale properties. Slight increase in the resistivity by 5-15% is typically the disadvantage of alloyed Cu wires. However, if the wire exhibits superior reliability performance especially under HAST, the wire is attractive even with increased resistivity and cost.

Example embodiments of the present invention seek to provide alloyed 2N Cu wire for bonding in microelectronics that can provide high reliability performance with reduced compromises in other properties.

SUMMARY

According to an aspect of the present invention, there is provided an alloyed 2N copper wire for bonding in microelectronics consisting essentially of~~comprising~~ one or more of a group of Ag, Ni, Pd, Au, and Pt~~, and Cr~~ as corrosion resistance alloying material~~, wherein a concentration of said corrosion resistance alloying material is between about~~ 0.009wt% to~~and about~~ 0.99wt%, optionally a deoxidizer alloying material selected from one or more of Ca, Ce, Mg, La, Al and P, optionally a grain refiner alloying material selected from one or more of Fe, B, Zr and Ti, optionally S, and the balance of Cu.

The corrosion resistance alloying material comprises about 0.009wt% and about 0.99wt% of Ag.

The corrosion resistance alloying material comprises about 0.009wt% and about 0.99wt% of Ni.

The corrosion resistance alloying material comprises about 0.009wt% and about 0.129wt% of Pd.