Effect of metal-complexes and chelating agents in metal CMP slurry

Jaeseok Lee,[1] Wonlae Lim,[1] Donghun Kang,[1] Inkyung Lee[1] and Kilsung Lee[1]

[1]Cheil Industries
332-2
Gochundoong
Euiwanfshi, Kyungkido 437010
Korea

It was investigated that the effects of various metal-complexes and chelating agents on chemical mechanical polishing(CMP) of metal slurry.

As the primary particle size of abrasive decrease, increase the removal rate of metal layer and decrease erosion. But, in case of oxide, it shows opposite result. In tungsten slurry, small abrasive particle size shows high selectivity between tungsten and oxide layer.

The effects of chelating agent in tungsten slurry were studied by the removal rate, wet etch rate, recess and seam. Using the metal-complex type as chelating agent, it could be achieved low wet etch rate, low erosion and low seam. The metal-complex prevents from the corrosion of tungsten layer and make passivation layer well. Using the various metal-complex, the removal rate of metal layer was studies. Different type of metal complex shows different removal rate. It was estimated by electrochemical corrosion method and polishing.

The removal rate change of tungsten layer was studied by using various glycol derivatives. Glycol derivatives function as a chelating agent which catch the oxidized metal ion, so it can be activated removal rate.