

ECMP 공정에서 전해질에 따른 Cu 표면 특성 평가

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Surface Characterization of Cu as Electrolyte in ECMP

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Abstract : Cu CMP widely has been using for the formation of multilevel metal interconnects by the Cu damascene process. And lower dielectric constant materials are required for the below 45nm technology node. As the dielectric constant of dielectric materials are smaller, the strength of dielectric materials become weaker. Therefore these materials are easily damaged by high down pressure during conventional CMP. Also, technical problems such as surface scratches, delamination, dishing and erosion are also occurred. In order to overcome these problems in CMP, the ECMP (electro-chemical mechanical planarization) has been introduced. In this process, abrasive free electrolyte, soft pad and low down force were used. The electrolyte is one of important factor to solve these problems. Also, additives are required to improve the removal rate, uniformity, surface roughness, defects, and so on. In this study, KOH and NaNO₃ based electrolytes were used for Cu ECMP and the electrochemical behavior was evaluated by the potentiostat. Also, the Cu surface was observed by SEM as a function of applied voltage and chemical concentration.

Key Words : ECMP, KOH, NaNO₃