

집속이온빔 장치를 이용한 RF O₂-Plasma 처리한 MgO 보호막의 스퍼터링 수율 측정

(Measurement of Sputtering Yield of RF O₂-Plasmas treated
MgO layer by using FIB System)

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We studied the measurement of sputtering yield of RF O₂-Plasma treatment on MgO protective layer in AC-PDP by using Focused Ion Beam System. MgO layer of 1000 Å thickness was deposited on ITO coating on glass substrates by using an electron gun evaporator at 200 °C at vacuum environment, 2.4×10^{-6} Torr. Thereafter MgO samples were annealed at 300 °C for 30 minutes. RF O₂-Plasma was treated the surface of the MgO layer. Oxygen gas was fed for RF discharge and the process pressure was 110 mTorr. The RF power and time was 50 W and 10 minutes⁽¹⁾, respectively. An 1000 Å thickness Al layer was deposited on the MgO layer in order to avoid the charging effect of the MgO layer during measurements of the sputtering yields.

A Ga liquid metal ion source is used as the focused ion beam (FIB) source. The ion beam was focused by the double einzel lens system, and a deflector was employed to scan ion beams on the surface of MgO layer. The sputtering yield of the MgO layer is determined by using the analyzed probe current, the secondary electron current, and the net current. When the acceleration voltage of the FIB system was applied by 10 kV and the emission current 5 μA was detected at faraday cup. We obtained result that the sputtering yield of the untreated sample and treated sample were 0.33 and 0.20, respectively.

[참고문헌]

1. 정재천, “산소 플라즈마 처리후의 이차전자방출계수(γ)를 이용한 MgO 보호막의 일함수(Φ_w) 변화” 한국전기전자재료학회논문지, 1226-7945, 제 18권3호, pp.259-263 (2005).