

OES를 이용한 펄스 마그네트론 스퍼터링의 공간분포에 관한 연구
Spatially Resolved Optical Emission Spectroscopy of Pulse
Magnetron Sputtering Discharge

김용모*, 정민재, 한전건(성균관대학교 플라즈마 응용 표면기술연구센터)
오수기 (아주대학교)

1. 서론

At present, magnetron sputtering is a well established technology, currently used for the deposition of a variety of thin films.

In order to characterize the pulse magnetron discharge, various method are used. Among them, OES is widely used because it is a non-contact method with plasma.

However, OES is generally measures integrated emission, or emission coming from limited zone of plasma. The spatially resolved optical emission spectroscopy of various species of a pulse dc unbalanced magnetron sputtering is studied.

2. 특징 및 공정(크기 10, 진하게) 본론

Ar-N₂ gas mixtures are used. Emission lines corresponding to the Titanium cathode and the gas discharge species (Ar I, Ar II, N₂, N₂⁺ and N) are considered.

In this study, the 2-D emission profiles of the lines are measured by an ICCD camera during the TiN coatings.

3. 결과 요약(크기 10, 진하게)

Using optical emission spectroscopy, we have been observed 2-D emission profiles above the substrate in pulsed DC plasma during magnetron sputtering process.

Discharge voltage and emission intensity were increased as increase discharge current also, plasma density was increased.

In pulse frequency case, discharge voltage and emission intensity were increased as increase frequency, but plasma density was decreased.

Discharge voltage, emission intensity and plasma density were decreased as increase pulse duty cycle.

Micro hardness was measured from around 20 Gpa to 35 Gpa.