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The effect of magnetron rotation on plasma characteristics and the physical properties of films

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1. 서론

Magnetron sputtering with an accurate control of process parameters has proven to be one of the most effective methods for thin film deposition[1]. To achieve high quality film deposition in many industrial application fields, various magnetron sources have been developed. Especially in the electronic applications, the developments of the large-area circular planar magnetron sources and of the corresponding process are required because the 300 mm wafer process was already established and a larger wafer process will be introduced.

2. 본론

There are surprisingly few reports dealing with the effects of the magnetron rotation on plasma characteristics and the physical properties of films. Therefore, as a first step of the above investigations, the poisoning effect on oxide film synthesis was investigated by using the homemade 8 inch circular moving magnetron source in reactive mode with a oxygen lambda sensor control. The magnetron rotation speed was changed from 0 rpm to 36 rpm.

3. 결과

At the conditions of below 4 rpm, the discharges were breakdown and at above 6 rpm, the transition zone in poisoning curve was increased with the rotation speed. And the deposition rates were decreased about 20 % in proportion to the transition zone. The I-V characteristic of discharge was monitored by a current probe and an oscilloscope. Micro-structure was examined by XRD and transparencies were analyzed by UV-visible spectrometer.

참고문헌

[1] J. Musil, Surface coatings Technol. 100-101(1998)280-286