

Abstract Submitted
for the GEC05 Meeting of
The American Physical Society

Ti Surface Oxidization by Microwave Discharge Oxygen Plasma and Plasma Parameters SATORU KAKIZAKA, TAKESHI SAKAMOTO, HARUAKI MATSUURA, HIROSHI AKATSUKA, Tokyo Institute of Technology, TOKYO INSTITUTE OF TECHNOLOGY TEAM — We made an experimental study on Ti surface oxidization by microwave discharge oxygen plasma, which was generated in a cylindrical quartz tube (26 mm id.) with its discharge pressure 0.5 - 10.0 Torr. The microwave frequency was 2.45 GHz and the output power was set at 600 W. The gas flow rate was set at about 0.01 – 1.6 l/min. The titanium sheet ($15 \times 15 \times 0.2$ mm³) was set at the position 60 mm down from the centerline of the microwave guide. The treatment time was 1 hour. We measured basic parameters of microwave oxygen plasma, such as electron density (N_e), electron temperature (T_e) by a double probe, vibrational and rotational temperatures (T_v , T_r) by OES. It was found that the $N_e \sim 10^{11}$ cm⁻³, $T_e \sim 5$ eV, $T_r \sim 0.14$ eV and $T_v \sim 0.25$ eV, respectively, at a low discharge pressure. Only the rutile pattern was found for the samples by XRD. We are examining the effect of admixture of noble gases with oxygen.

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Date submitted: 10 Jun 2005

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