

Abstract Submitted
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Preparation and study of Titanium Nitride films by reactive sputtering and an investigation of target poisoning during the process.¹

TAREQUE AZIZ, ABDUL RUMAIZ, Brookhaven Natl Lab — Titanium Nitride (TiN_x) thin films were prepared by reactive dc sputtering in presence of Ar- N_2 plasma. The thin films were grown on Quartz and pure Si surfaces. The Ar- N_2 content ratio was gradually varied while the substrate and the Titanium target were kept at room temperature. Structural properties, optical and electrical properties of the thin films were studied by using X-ray Photoelectron Spectroscopy (XPS) and XRD and 4 probe resistivity measurement. Target poisoning of the Ti target was also studied by varying reactive gas concentration and measuring the target current. A study of target current vs growth rate of the films was performed to investigate the onset of “poison” mode. Although there was an insignificant drop in plasma current, we noticed a drop in the deposition rate. This result was tested against Monte Carlo simulations using SRIM simulations. Effects of annealing on the crystallinity and the sheet resistance will also be discussed.

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