Abstract

By using a homemade dual magnetron sputtering system, two combined investigations by Optical emission spectroscopy and by Rutherford backscattering spectrometry were performed on a Radio-Frequency discharge for Titanium and Nickel deposited in pure Argon gas. Line intensities of various species present in the plasma were compared to the Argon emission line I of 696.5 nm for different gas pressure and power density values. The electron temperature was also determined from the collisional radiative model and then correlated to the gas pressure and the power density. It was found that the sputtering pressure alters the spectrum intensity of Nickel, but has no obvious effect on that of Titanium during sputtering. The variation of average deposition rate as a function of gas pressure was experimentally determined via the Rutherford backscattering technique and then correlated to the variation of electron temperature of (Titanium-Argon) and (Nickel-Argon) discharges versus gas pressure.