

ABSTRACT

Helium plasma has been widely used for the production of active species by mixing in other gases, which are used for surface modification of metals. Helium plasma is generated using 100 Hz pulsed DC source and its characterization is carried out by using optical emission spectroscopy. The spectra of helium is recorded at filling pressure (0.5-3.0 mbar), source power (25-150 W) and inter-electrode distance (3-5 cm) using Ocean Optics HR 4000 spectrometer. It is found that production of active species of helium strongly depends on discharge parameters. Evolution of the selected emission intensities of He-I and He-II transitions are presented in this thesis. The relative emission intensities of He-I (501.6 nm and 728.1 nm) and of He-II (447.2 nm) transitions as a function of above parameters are used for the determination of electron temperature. Electron temperature is found to vary from 0.82 eV to 2.50 eV depending on the various discharge parameters.