ABSTRACT

The equilibrium process of plasma nitrogen species by chemical kinetic reactions along various pressures is successfully investigated. The equilibrium process is required in industrial application to obtain the stable condition when heating up the material for having homogenous reaction. Nitrogen species densities is modeled by a continuity equation and extended Arrhenius form. These equations are used to integrate the change of density over the time. The integration is to acquire density and the reaction rate of each reaction where temperature and time dependence are imposed. A comparison is made with global model within pressure range of 1- 100mTorr and the temperature of electron is set to be higher than other nitrogen species. The results shows that the chemical kinetic model only agrees for high pressure because of no power imposed; while the global model considers the external power along the pressure range then the electron and nitrogen species give highly quantity densities by factor of 3 to 5.