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Optical and Electrical Characteristics of AC Glow Discharge Plasma in N_2O H. MARTÍNEZ, Centro de Ciencias Físicas, UNAM, F.B. YOUSIF, Facultad de Ciencias, UAEM, A. ROBLEDO, UAM, Acopotzalco, F. CASTILLO, Instituto de Ciencias Nucleares, UNAM, A.B. MONDRAGÓN, Facultad de Ciencias, UAEM, CCF-UNAM TEAM, FC-UAEM TEAM, UAM-ACOPOTZALCO TEAM, ICN-UNAM TEAM — This paper considers the optical and electrical characterization of AC glow discharge plasma in the abnormal glow mode used for optical emission spectroscopy. The total discharge current and applied voltage are measured using conventional techniques. Optical emission spectroscopy was used to determine the main emission lines of the glow discharge plasma of N_2O at pressures between 0.5 and 4.0 Torr. It shows that the discharge emission range is mainly within 300 – 400 nm. The emission lines at 315.98, 337.55, 354.20, 357.24, 380.09 and 391.42 nm corresponding to NO, O_2 , and O_2^+ are the dominant lines in the glow discharge plasma in the present study. Intensity of the emission lines show linear increase with the discharge current up to 0.6 A followed by saturation at higher currents. The emission consists of NO, O_2^+ and O_2 narrow peaks. No emission lines were identified with the atomic oxygen leading us to conclude that the atomic oxygen is produced either in the $O(^5S)$ state that is sufficiently energetic and most likely is lost collisionally, or produced in its ground state $O(^3P)$ or the metastable state $O(^1D)$ that is quenched in collisions with N_2 resulting in $O(^3P)$.

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