

Abstract Submitted
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Emission spectroscopy of anharmonic vibrational series for micro-hollow cathode discharge plasmas¹ A. LOZANO F., A.M. JUÁREZ, Instituto de Ciencias Físicas, Universidad Nacional Autónoma de México, P.O Box 43-8, Cuernavaca, Morelos, 62251, México — The field of micro plasmas is currently very active, due to the useful properties and potential applications of micro-hollow cathode discharges. Our group is currently developing these discharge characterization techniques and, as a first obvious starting point, we are performing emission spectroscopy in normal discharges. The focus of this particular contribution is to present a study of vibrational eigenvalues of Morse potential for diatomic molecules. We performed the experimental measurements of these eigenvalues using a high resolution optical monochromator and a parallel plate nitrogen discharge in the glow regime. In particular we determined using this simple arrangement the ro-vibration transitions in N₂, between the electronic states $C^3\Pi_u - B^1\Pi_g$. Moreover, we evaluated theoretically the anharmonic eigenvalues of these transitions using Wigner function for a Morse potential. Based on experimental measurements and making use of the calculated Franck-Condon factors it is possible to extract energy potential parameters of these energy states directly from measured transitions. In particular we have calculated the internuclear separation between the excited states associated with the vibrational transitions observed.

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