

HYBRID LINE LIST AND SPECTROSCOPIC MODEL FOR CN

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Accurate line lists are important for the description of the spectroscopic nature of small molecules. Given the significant role played by the CN radical in the chemical and astrophysical sciences, we present the process of creation for a new line list, from the collation of experimental data to the production of a hybrid line list. 8083 empirical rovibronic energy levels with uncertainties are determined for 8 doublet states of CN using the MARVEL (Measured Active Rotational-Vibrational Energy Levels) algorithm from 40,333 transitions. These empirical energy levels are utilised in a fitting process to create a spectroscopic model of the three lowest electronic states, using the nuclear motion program; DUO. A final Hybrid line list (up to 60,000 cm^{-1}) has been created with the addition of results from a pre-existing model Hamiltonian line list (MoLList). Applications of the Spectroscopic Model are explored for the calculation of sensitivities to a variation of the proton-to-electron mass ratio.