LINE STRENGTHS FOR SINGLE-PHOTON TRANSITIONS BETWEEN DOUBLET LEVELS

ROBERT P. LUCHT, AMAN SATIJA, *Mechanical Engineering, Purdue University, West Lafayette, IN, USA*.

The focus of this paper is the calculation of radiative transition rates between doublet electronic levels in diatomic molecules. A different formulation for listing Hönl-London factors is introduced that enables the straightforward inclusion of higher-order correction factors for effects such as centrifugal distortion and Lambda-doubling in the calculation of the radiative transition rates. The formulae for the Hönl-London factors are developed using Hund's case (a) basis states and the correction factors for spin-orbit splitting, centrifugal distortion, spin-rotation interactions, and Lambda-doubling and included in the Hund's case (a) coefficients for the state wavefunctions. Inclusion of Herman-Wallis effects in the calculation of the radiative transition rates is also illustrated for the hydroxyl radical and nitric oxide. The Herman-Wallis correction factors are incorporated in a straightforward fashions in the tables of line strength factors.