Analytical Evaluation of Two-Center Franck-Condon Overlap Integrals over Harmonic Oscillator Wave Function

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A unified treatment of Franck-Condon (FC) overlap integrals with arbitrary values of parameters is described. These integrals are represented in terms of binomial coefficients. For quick calculations, the binomial coefficients are stored in the memory of the computer. Therefore, the CPU time has been greatly reduced. Numerical results presented agree excellently with those obtained in the literature.

Key words: Franck-Condon Factors; Harmonic Oscillator Wave Function; Overlap Integral; Binomial Coefficients.