Eigensolutions to the schrödinger equation for selected diatomic molecules

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In this work, the solutions of the Schrödinger equation with class of inversely quadratic plus Hulthén potential models are obtain using the Nikiforov-Uvarov method with an approximation to the centrifugal term. We obtained the energy spectrum and normalized wave function. The energy spectrum was used to compute the numerical bound state for selected diatomic molecules (N2, O2, NO, and CO) for different rotational and vibrational quantum numbers utilizing their corresponding spectroscopic data. Our findings demonstrate that the energy eigenvalues are highly sensitive to the potential and diatomic molecule characteristics, with no divergence between the -wave and -wave, implying that the approximation scheme is well suited for these set of potentials. For accuracy of our work, eight special cases of this potential were obtained, and the results are consistent with previous reports in the literature.

Biography

Benedict Ita is a Professor of Physical and Theoretical Chemistry. He has done a lot of research and published some papers in quantum Mechanics. He completed his PhD in Physical and Theoretical Chemistry at University of Calabar in Nigeria at 33 years old. He is now 55 years old and has been lecturing since 1990. He has held many positions at the University of Calabar. He has over 52 papers in Web of Science.