When we estimate energy levels of molecules (eigenvalues of electronic Hamiltonians), we need error estimates to know how close the values are to the actual eigenvalues. A method to obtain such an error estimate is to seek both upper and lower bounds of the eigenvalue. An upper bound is obtained by the variational method, but accurate lower bounds are very difficult to achieve. Known methods for lower bounds are unsatisfactory in terms of their accuracy or applicability to even small molecules. With respect to the applicability one of the main difficulties is evaluation of integrals in the expression of the lower bound. The integrals have similar forms as that of multi-center integrals in the variational methods, but the integrands have squared Coulomb potentials as a factor instead of the usual Coulomb potential in the variational method. The Laplace or Neumann expansion used for the variational method is not applicable to the squared Coulomb potentials. In this talk, methods for evaluation of the integrals free from such expansions are derived. Numerical results by the methods will also be shown.