Relationship between the 2-body Energy of the Biswas-Hamann and the Murrell-Mottram Potential Functions

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The two-body interactions in the Biswas-Hamann (BH) and Murrell-Mottram (MM) potential functions are analytically related in this paper by equating the zeroth to second differentials at equilibrium bond length. By invoking the Maclaurin series expansion for the exponential term, the MM potential function could be expressed in a manner that enables comparison of repulsive and attractive terms. Approximate and refined sets of scaling factors were obtained upon comparing the indices and coefficients, respectively. Finally, the suitability for each set of scaling functions is discussed in terms of the "softness" of the bonds.

Key words: 2-body Energy; Empirical Potential Functions; Parametric Conversion.