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Second virial coefficient of bounded repulsive potentials

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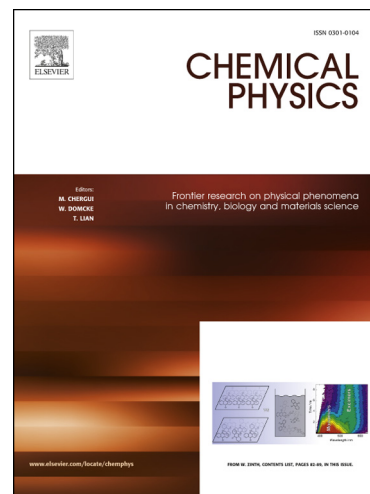
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Abstract

Exact series expansion formulas are derived for the second virial coefficient, SVC, of a wide range of purely repulsive bounded potentials. The focus is on the consequences of the functional form, choice of disposable parameters, and temperature on the SVC characteristics. These include compressed and stretched exponential forms, and bounded inverse power (BIP) potentials, which are an extension of the inverse power system. The BIP have a quite different SVC temperature dependence to the exponential cases, characteristics which could be used to represent polymer based dispersed particles which are not accounted for by a gaussian. A new algebraic form of bounded potential is proposed whose SVC at high temperature tends to the Penetrable Sphere, but at low temperature to the BIP class.

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