Development of equation of state applicable to Solid, Vapor and liquid phases of small gases

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In this work, we present an equation of state closely describing the three phase behavior of real substance. The repulsive contribution of the model is based on Hard-dumbbell model and the attractive contribution is developed by following the generalized van der waal theory with the empirical radial distribution function in which the characteristic behavior of the function depending on phase is approximately considered. When tested against N2, CH4 and Ar, the proposed model was found to closely describe the T－P and T－V diagram of the molecules