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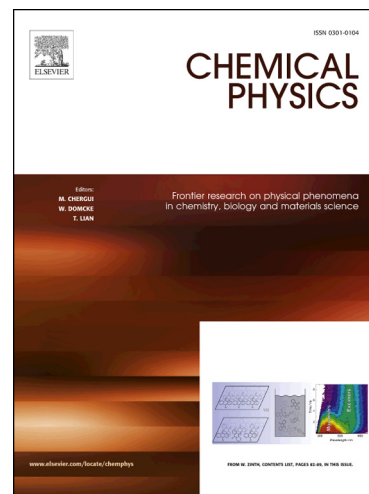
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Exact analytical calculations of thermodynamic functions of gaseous substances

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Abstract

We have considered the improved Tietz potential for diatomic molecules. We have analytically solved the Schrödinger equation for this potential model and derived the analytical expression for the energy spectra. Then, we have analytically obtained the thermodynamic functions for six gaseous substances such as HCl, HF, DF, BBr, CO and NO using the potential model. For this goal, we have calculated mean energy, specific heat, and free energy and compared with experimental data. Our results show that the calculated thermodynamic properties at room temperature are in agreement with experimental data.

Keywords: Gaseous substances, Thermodynamic functions, Diatomic molecules

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