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High Temperature Statistical Thermodynamics of Molecules in Gases and Plasmas

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Message from the Guest Editor

The present Issue is devoted to fundamentals of high temperature statistical thermodynamics of small molecules and applications of partition functions and thermodynamic properties. High temperatures are understood broadly ranging from 1000K to tens of thousands of Kelvins.

Applications of high temperature statistical thermodynamics are scattered over several areas of research – the general chemical physics/physical chemistry, combustion (temperatures of thousands of Kelvins are of interest), plasma science (whole range of temperatures mentioned above can be of interest), hypersonic flows (also shock waves and aerothermodynamics; temperatures of tens of thousands of Kelvins are often of interest) and equations of state.

In plasmas and flows the non-equilibrium conditions often arise and translations, rotations and vibrations of molecules are characterized by different temperatures. The kinetic theory is then needed to connect external conditions with thermodynamical quantities.

The main scope is theoretical studies of various gas and plasma systems but experimental studies are also welcomed.

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Message from the Editor-in-Chief

The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

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