

Objectives of Chapter 19

The kinetic theory of gases is one of the main subjects of thermodynamics.

A gas that fills a container consists of atoms and molecules that are in perpetual motion. The applications of the kinetic theory of gases can be found in various branches of engineering.

The gas we are treating in this chapter is ideal.

After reading this chapter you should be able to:

1. Know the relationship between pressure, volume and temperature for an ideal gas
2. Calculate the work done on a gas during an isothermal, isobaric, and isochoric processes.
3. Calculate the root mean square speed of a gas molecule if its temperature is known
4. Relate the kinetic energy of a gas to its temperature and molecular mass
5. Distinguish between the molar specific heat at constant pressure and that at constant volume for a gas
6. Know the relationship between pressure, temperature and volume for an adiabatic expansion of an ideal gas