

Chapter 13 Temperature and Kinetic Theory

1. Be able to state the four postulates of the Ideal Gas model.
2. Be able to describe Brownian motion and its significance with respect to the atomic model for matter.
3. Be able to describe what is meant by the terms “macroscopic” and “microscopic.”
4. Be able to convert among Kelvin, Celsius, and Fahrenheit scales given an appropriate conversion relation.
5. Be able to calculate the change in length of a bar that undergoes a specified change in temperature, given the initial length and composition of the bar and a table of coefficients of linear expansion.
6. Be able to calculate the change in volume of an object that undergoes a specified change in temperature, given the initial volume and composition of the bar and a table of coefficients of linear expansion.
7. Be able to explain why a bimetallic strip curves when heated or cooled.
8. Be able to give examples of expansion joints from everyday life and to describe why they are needed.
9. Be able to describe how the pressure of a sample of ideal gas depends upon its volume in words and in a quantitative plot of P vs V .
10. Be able to describe how the volume of a sample of ideal gas depends upon its Kelvin temperature in words and in a qualitative plot of V vs T .
11. Be able to use the ideal gas law to find an unknown among P , V , N , and T .
12. Be able to use the ideal gas law to find the unknown among P , V , and T for a single sample of gas that undergoes changes without losing or gaining particles.
13. Be able to calculate the total energy possessed by an ideal gas, given P , V , N , and T .
14. Be able to calculate v_{rms} and $\overline{\text{KE}}$ for a known gas at a given temperature.
15. Be able to describe several phenomena that can be more or less accurately accounted for by the Ideal Gas model.
16. Be able to describe some failures of the Ideal Gas model to account for real systems.
17. Be able to describe accurately the Maxwell-Boltzmann graph of the distributions of particle speeds in a gas.
18. Be able to describe things that you have observed that illustrate something we have dealt with in this chapter.