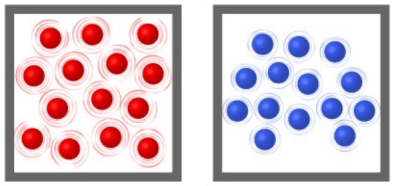
Extra Practice: Ch 6 Materials

Oct 12, 2022

Conservation of Energy

1) Suppose a system is in thermal equilibrium with a heat bath. If the temperature of the heat bath increases, describe in words and/or illustrations what happens to the temperature of the system.

2) Consider two isolated systems illustrated below. One system (left) is at 100°C and the other (right) is at room temperature of 20°C. The isolated systems are allowed to come into contact reaching thermal equilibrium and without losing energy to the surrounding. What is the final temperature? Describe in words and/or illustrations what happened.



3) A kilogram of aluminum metal and a kilogram of water are each warmed to 75 °C and placed in two identical insulated containers. One hour later, the two containers are opened, and the temperature of each substance is measured. The aluminumvhas cooled to 35 °C, while the water has cooled only to 66 °C. Explain this difference.

Calorimeter

4) Potassium perchlorate is used as an oxidizer in fireworkds. Calculate the heat required to raise the temperature of 10.0g of potassium perchlorate from 25°C to an ignition temperature of 900.°C. The specific heat capcity of potassium perchlorate is 0.8111 J/(°C g).

Heat Capacity

5) Calculate the heat that must be supplied to a 500.0g copper kettle containing 400.0g of water to raise its temperature from 22.0°C to the boiling point of water 100.0°C. What percentage of the heat is used to raise the temperature of the water? Heat capacity of copper is 0.38 J/(°C g) and water is 4.184 J/(°C g).