Chapter 15

Thermodynamics

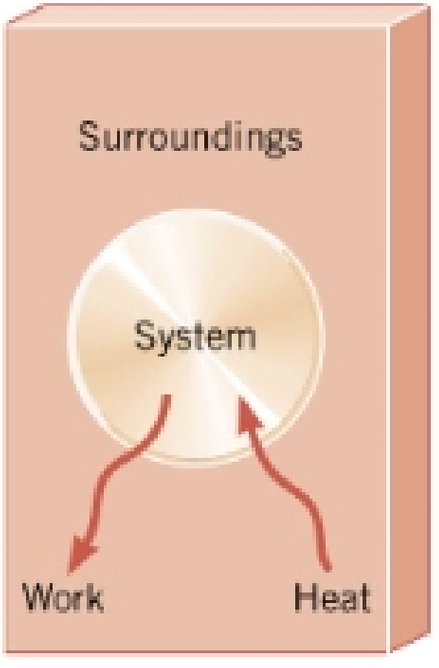
15.1 Thermodynamic Systems and Their Surroundings

Thermodynamics is the branch of physics that is built upon the fundamental laws that heat and work obey.

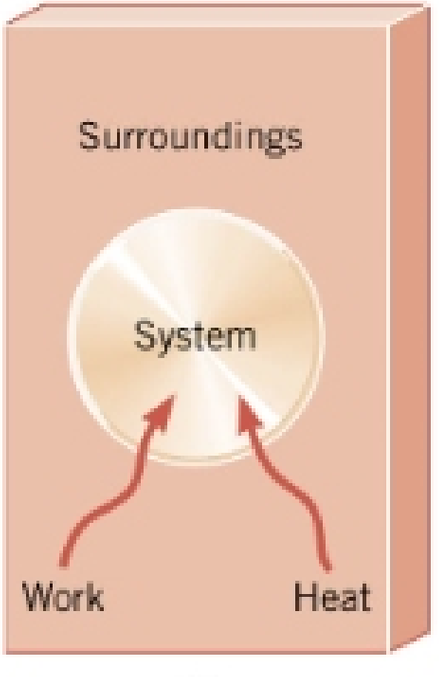
The collection of objects on which attention is being focused is called the ***system***, while everything else in the environment is called the ***surroundings***.

Walls that permit heat flow are called ***diathermal walls***, while walls that do not permit heat flow are called ***adiabatic walls***.

To understand thermodynamics, it is necessary to describe the ***state of a system***.



(a)



(b)

15.2 The Zeroth Law of Thermodynamics

Two systems are said to be in ***thermal equilibrium*** if there is no heat flow between then when they are brought into contact.

Temperature is the indicator of thermal equilibrium in the sense that there is no net flow of heat between two systems in thermal contact that have the same temperature.