Exercise Chapter 2
First Law of Thermodynamics

By
Dr. Norhayati Abdullah
Faculty of Chemical and Natural Resources Engineering

yatiabdullah@ump.edu.my

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EXERCISE 1

1. Determine the work needed for a bird of mass 120 g to fly to a height of 50 m from the surface of the earth.

2. Assume an ideal gas in a piston chamber, where the initial volume is 2.00 L and the initial pressure is 10.00 atm. Assume that the piston is moving up (that is, the system is expanding) to a final volume of 6.50 L against a constant external pressure of 1.75 atm. Also assume constant temperature for the process.

a) Determine the work for the process
b) Determine the final pressure of the gas

EXERCISE 2

- Assume in the course of a test someone does 622 kJ of work on an exercise bicycle and loses 82 kJ of energy as heat. Determine the change in internal energy of the person?

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EXERCISE 3

- Determine the energy required to vaporize 2 mol H_2O at 1 bar.

  ΔH_{vap} = 81.4kJ/mol

- Calculate the standard enthalpy of sublimation of ice at 0^oC from its standard enthalpy of fusion at 0^oC (6.01kJ/mol) and the standard enthalpy of vaporization of water at 0^oC (45.07kJ/mol)

Authors Information

Credit to the authors: Dr Suriati Ghazali, Dr Sunarti