



Assignment Phys 2-06-2020

Physics 2 (Trường Đại học Quốc tế, Đại học Quốc gia Thành phố Hồ Chí Minh)

THE INTERNATIONAL UNIVERSITY (IU)
VIETNAM NATIONAL UNIVERSITY - HCMC

ASSIGNMENT

SUBJECT: PHYSICS 2

GROUP: 8 – 10 STUDENTS

(Submit: 09:40, 20/06/ 2020, Room A2.205, IU)

Student Name: _____ Student ID: _____

1/ (30 pts) You have two identical containers, one containing gas A and the other gas B. The masses of these molecules are $m_A = 3.34 \times 10^{-27}$ kg and $m_B = 5.34 \times 10^{-26}$ kg. Both gases are under the same pressure and at 10.0°C .

(a) Which molecules (A or B) have greater translational kinetic energy per molecule and rms speeds?

Now you want to raise the temperature of only one of these containers so that both gases will have the same rms speed.

(b) For which gas should you raise the temperature?

(c) At what temperature will you accomplish your goal?

(d) Once you have accomplished your goal, which molecules (A or B) now have greater average translational kinetic energy per molecule?

2/ (20 pts) A gas undergoes two processes. In the first, the volume remains constant at 0.200 m^3 and the pressure increases from $2.00 \times 10^5 \text{ Pa}$ to $5.00 \times 10^5 \text{ Pa}$. The second process is a compression to a volume of 0.120 m^3 at a constant pressure of $5.00 \times 10^5 \text{ Pa}$.

(a) In a pV-diagram, show both processes.

(b) Find the total work done by the gas during both processes.

3/ (25 pts) Two moles of an ideal monatomic gas go through the cycle *abc*. For the complete cycle, 800 J of heat flows out of the gas. Process *ab* is at constant pressure, and process *bc* is at constant volume. States *a* and *b* have temperatures $T_a = 200 \text{ K}$ and $T_b = 300 \text{ K}$.

(a) Sketch the **all possible** pV-diagrams for the cycle.

(b) What is the work *W* for the process *ca*?

4/ (25 pts) A cylinder 1.00 m tall with inside diameter 0.120 m is used to hold propane gas (molar mass 44.1 g/mol) for use in a barbecue. It is initially filled with gas until the gauge pressure is $1.30 \times 10^6 \text{ Pa}$ and the temperature is 22.00°C . The temperature of the gas remains constant as it is partially emptied out of the tank, until the gauge pressure is $2.50 \times 10^5 \text{ Pa}$.

Calculate the mass of propane that has been used.

END OF QUESTION PAPER