

Name: _____

Problem Set 4

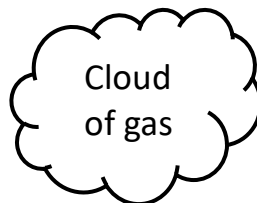
Due Friday, September 28 at 10am

Submit Parts A-B on paper in Class or to Moodle. Submit Part C via Moodle only.

Part A – Conceptual Questions

Answer each of the questions below on a separate sheet of paper. Write legibly or type your answers, which should be in complete sentences and must be in your own words. Each question is worth 3 points.

1. Describe in your own words the physical argument against a model of the atom where electrons are kept in orbit around the nucleus by the force of gravity.
2. Describe in your own words the sequence of logical steps that leads from equation 5.9 in C&O to equation 5.13.
3. Label in the diagram below locations/lines of sight along which an observer would measure (a) a blackbody spectrum, (b) an absorption spectrum, (c) an emission spectrum. In each case, describe why you made that choice.



4. Draw a simple schematic Boltzmann distribution (label the axes with units, but they don't need to have specific numbers). Label the most probable speed and the average speed. Sketch in a Boltzmann distribution for a gas at a higher temperature and one at a lower temperature. Describe in words the properties of the distribution that change as the temperature changes and why.

Part B – Quantitative Questions

Write out your answers neatly or type them up. Show your work, and make sure all answers have appropriate units. Consider significant figures in reporting final answers.

1. C&O 3.16
2. C&O 5.9
3. C&O 5.10
4. C&O 8.1
5. C&O 8.3
6. C&O 8.4
7. C&O 8.6

Part C – Computational.

See supplemental file