A

The Gas Laws – Study Guide

*sections 9.1 and 9.2 in OpenStax*

**Pressure (Sections 9.1)**

The pressure is defined as\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The SI unit for pressure is\_\_\_\_\_\_\_\_\_. However, chemists use \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_ more commonly as units for measuring pressure.

Complete the following conversion table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | kPa | torr | atm |
| 680.0 mm Hg |  |  |  |
| 14.7 psi |  |  |  |

List the following data in order of increasing pressure:

(a) 102 kPa (b) 782 torr (c) 1.05 atm

**Gas Laws (Section 9.2)**

The 4 variables or physical properties that are used to define the state of a gaseous system are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The constant variables in Charles’ law are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the changing variables are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The constant variables in Boyle’s law are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the changing variables are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The constant variables in Avogadro’s law are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the changing variables are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Suppose a gas has an initial pressure of 2.0 atm. What happens to the pressure if the volume is doubled (*assuming the temperature and moles of gas remain unchanged*)?

To solve this problem, one needs to use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_’s law.

Now suppose a gas occupies 1.5 liters at a certain temperature and pressure. What happens to the volume if the number of moles of gas is tripled?

To solve this problem, one needs to use \_\_\_\_\_\_\_\_\_\_\_\_\_’s law.

***Watch the video tutorials on*** [***Boyle’s Law***](https://www.youtube.com/watch?v=E7jsrdfh82Q&feature=youtu.be) ***and*** [***Charles’ Law***](https://www.youtube.com/watch?v=HCPuOCrj3l0&feature=youtu.be)***.***

All of the above gas laws can be combined into one overall equation, called the **Combined Gas Law Equation**.



Any variables which are held constant may be cancelled out of this equation.

**End of Chapter 9 Practice Problems**

#5, 19, 27, 29, 45

For detailed solutions to these problems, go to the [OpenStax website](https://openstaxcollege.org/textbooks/chemistry/resources) and download the “Student Answer and Solution Guide.”