Gases

Kinetic Molecular Theory – the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in all forms of matter are in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Properties of Gasses

Pressure –

* Measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Volume –

* Measured in \_\_\_\_\_ or Liters

Amount –

* Measured in \_\_\_\_\_\_\_\_\_\_\_
* Convert mass to moles by \_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Temperature – measured in units called \_\_\_\_\_\_\_\_\_\_\_\_\_

* Convert C to K by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Gas Laws – For a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (pressure, temperature, or volume) affects the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Boyle’s Law – the \_\_\_\_\_\_\_\_\_\_\_\_ of a gas \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Inversely proportional –

Constant =

Equation:

1. Charles’s Law – the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a gas is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Directly proportional –

Constant =

Equation:

1. Gay-Lussac’s Law – the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a gas is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Directly proportional –

Constant =

Equation:

Combined Gas Law – relates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a single statement

Equation:

* Lets you solve problems if \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes at a time
* Helps you \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_all the other equations

Avogadro’s principle – equal \_\_\_\_\_\_\_\_\_\_\_\_of gas at the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_ contain equal numbers of \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Molar volume of a gas – the volume that \_\_\_\_\_\_\_\_\_\_ occupies at \_\_\_\_\_ and \_\_\_\_\_\_\_ pressure

STP (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

1 mol of gas at STP has a volume of \_\_\_\_\_\_\_\_\_\_

Ideal gas constant = \_\_\_\_\_\_

R = \_\_\_\_\_\_\_\_\_\_\_ if pressure is in atm

R = \_\_\_\_\_\_\_\_\_\_\_ if pressure is in kPa

R = \_\_\_\_\_\_\_\_\_\_\_ if pressure is in mmHg

Ideal Gas Law – relates the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Equation:

P = V = n = R = T =

Ideal gas vs. Real gas

* Particles take up **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* No **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Particles are in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** motion, moving in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_** until colliding with walls or each other
* Follows gas laws under **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of temperature and pressure

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is truly ideal!

* All gases have **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and are subject to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Collisions are not perfectly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

However…

Most gases will **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** at a wide range of temperatures and pressures

When will a real gas not follow the Ideal gas law?



Example:



Example:

Dalton’s law of partial pressures - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of a mixture of gases is equal to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of all the gases in the mixture

* Partial pressure – the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the total pressure contributed by a **\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_**

* Equation: