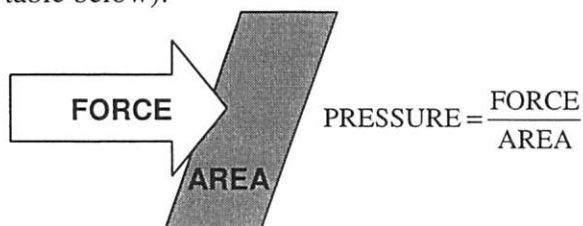


Pressure Conversions

Chem Worksheet 13-1

Name _____

Pressure is defined as the force pushing over a certain area. A gas pressure results from the many collisions between gas particles and their container. One common unit for pressure is the newton per square meter (N/m^2). This unit is called a **pascal** (Pa). Since it is so small it is often reported in thousands of pascals or **kilopascals** (kPa). The gases surrounding the earth exert a pressure of approximately 1 **atmosphere** (atm) at sea level. There are other units used to measure pressure (see the table below).



USEFUL EQUATIONS

| | |
|----------------------|---------------------|
| 1.00 atm = 101300 Pa | 1.00 atm = 760 mmHg |
| 1.00 atm = 101.3 kPa | 1.00 atm = 760 torr |
| 1.00 atm = 14.7 psi | 1 cm = 10 mm |
| 1 in. = 2.54 cm | |

examples

A container of gas measures the pressure to be 104.9 kPa. Convert this pressure to psi.

$$\frac{104.9 \text{ kPa}}{1} \times \frac{14.7 \text{ psi}}{101.3 \text{ kPa}} = 15.2 \text{ psi}$$

Atmospheric pressure is reported as 30.1 inHg. Convert this to torr.

$$\frac{30.1 \text{ inHg}}{1} \times \frac{2.54 \text{ cmHg}}{1 \text{ inHg}} \times \frac{10 \text{ mmHg}}{1 \text{ cmHg}} \times \frac{760 \text{ torr}}{760 \text{ mmHg}} = 765 \text{ torr}$$

Use the conversion factors in the table to solve the following problems.

1. The pressure is recorded as 738 mmHg. Convert this measurement to atmospheres (atm).
2. A ball is inflated to a pressure of 32.0 pounds per square inch (psi). Convert this pressure to atmospheres (atm).
3. What is the pressure in pascals if the pressure is equal to 380 torr?
4. The air pressure in a tire is 2.38 atm. What is this pressure in kilopascals?
5. The atmosphere supports a column of mercury that is 748 mm in height. What is atmospheric pressure in torr? Convert this pressure to atmospheres (atm).
6. Many pneumatic tools operate at an air pressure of 90 psi. What is the equivalent pressure in kilopascals (kPa)?
7. The safety disk in a scuba tank will blow at a pressure of approximately 25000 kPa. Convert this pressure to mmHg.
8. When a brake pedal is pressed with a pressure of 100 psi the pressure is converted about 1200 psi in the master cylinder. What is the pressure of the master cylinder in torr?
9. Normal atmospheric pressure in Mexico City is about 56.5 cm Hg. Convert this to atmospheres.
10. If the gas in a container can support 74 inches of mercury, what is the gas pressure in pascals (Pa)?