**Graham’s Law**



**Effusion and Diffusion**

- Effusion is the rate a gas escapes through an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 in a container.

- Diffusion is the rate at which a gas travels across a room.

If 2 different gases were placed in a container with an opening,

you can always predict which gas will escape through the opening

first or the fastest.

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ molar mass of the 2 gases will effuse \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1st to escape container).



Practice: He or Cl H2 or Ar Kr or F2

We can actually calculate the rate of effusion using Graham’s Law of effusion.

**Graham’s Law of effusion:** effusion rate is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ proportional to the square root of its molar mass.

 -Remember, \_\_\_\_\_\_\_\_\_\_\_\_\_ molecules escape more easily!



r = the rate of effusion of gas 1 and gas 2

M = molar mass of gas 1 and gas 2

ALWAYS choose the gas with the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mass as r1 because this one moves the fastest!

-Since this equation refers to the RATE of the gas, the answer will show how many TIMES faster gas 1 is compared to gas2.

-Lastly, the only thing you are plugging into this equation is the MOLAR MASS of each gas!

Ex 1) If equal amounts of neon (Ne) and argon (Ar) gases are placed in a porous container and allowed to escape, which gas will escape faster and how much faster?

Ex 2) If there is a hole in a balloon mixed with methane (CH4) and CO2 gases, which gas will effuse faster and how much faster?