

Chemistry – Unit 2 Review

To prepare to do well on the chapter 2 test, you should assemble your notes, the 3 worksheets and the quiz and review them, preferably in a small group where you can draw from each other's understanding. Here are the key points you should know.

Energy

Think of energy as a quantity that is always involved when there is a *change* in the state of matter. When a substance gets hotter or colder or changes phase, energy is either transferred into or out of the system. One way energy is stored in a system is **kinetic energy** (due to the motion of the particles). As particles move faster, their kinetic energy increases. As the particles move faster, they tend to move farther apart from one another. Temperature is a measure of the kinetic energy of the system.

1. Explain why the alcohol level in a thermometer rises when it is placed in a warmer fluid. (3-step process)
2. Explain why the alcohol level in a thermometer falls when it is placed in a cooler fluid. (3-step process)
3. Explain how the Celsius scale was devised and why it is not appropriate to use it when describing the behavior of gases. (review ws 1, PVTn lab)

Kinetic Molecular Theory

This theory describes all matter as being composed of tiny particles in endless random motion. In a solid, the particles vibrate, but are locked into an orderly array. In a liquid, the particles are still touching but are free to move around past one another. In a gas, the particles are moving very rapidly and are widely separated. Using a particle diagrams, represent samples of a cold gas and a hot gas.

Gas behavior

Gas pressure is a measure of the collisions of the molecules with the sides of the container. A barometer is used to measure atmospheric pressure; a manometer is used to measure the pressure in a container. (review ws 3)

The 3 variables P, V and T are interrelated. Any factor that affects the number of collisions has effect on the pressure. You should be able to:

- Predict the effect of changing P, V or T on any of the other variables.

$$P \propto \frac{1}{V} \quad P \propto T \quad V \propto T$$

- Explain (in terms of the collisions of particles) why the change has the effect you predicted.
- Explain why one must use the absolute temperature scale to solve gas problems.
- Use factors to calculate the new P, V or T (review ws 3). Make a decision as to how the change affects the variable you are looking for.
- Suppose that you lowered the temperature of a gas from 100°C to 50 °C. By what factor do you change the volume of the gas?
- Suppose that 25.0 mL of a gas at 725 mm Hg and 20°C is converted to standard pressure and temperature. What would be the new volume?