

Review #6: Kinetic Molecular Theory and the Gas Laws

1. Define or explain the following terms:

Kinetic Molecular Theory	Absolute zero	Freezing
Kinetic energy	Heating and Cooling Curve	Melting
Potential Energy	Sublimation	Boyle's Law
Temperature	Condensation	Charles' Law
STP and SATP	Evaporation	Dalton's Law of Partial Pressure

- Explain these observations in terms of the Kinetic Molecular Theory.
 - Gases are much less dense than solids and liquids.
 - Solids can not be significantly compressed.
 - The volume of a gas increases as it is heated.
- Explain how a melting curve for a substance can be used as an indicator of the purity of the substance. (How does the melting point of a pure substance differ from the melting point of an impure substance?)
- Describe what is happening to the motion of the particles of a gas as they are cooled, assuming that there is no change in volume and no change in state.
- When the temperature of a substance increases, the _____ (potential/kinetic) energy of the substance _____ (increases/decreases).
- When a substance changes state from liquid to gas, the _____ (potential/kinetic) energy of the substance _____ (increases/decreases).
- When a substance changes state from gas to solid, the _____ (potential/kinetic) energy of the substance _____ (increases/decreases).
- 95.0 kPa = _____ mm Hg
 - 14.0 PSI = _____ kPa
 - 175 °C = _____ K
 - 273 K = _____ °C
- To what temperature (in °C) must a gas be cooled at constant pressure so that it will occupy half of the volume it occupies at 100°C?
- Calculate** the volume of 1.00 mol of chlorine gas, Cl₂, at STP.
- What is the volume of 250.0 g of hydrogen gas, H₂, at 25°C and 100.0 kPa?
- At what Celsius temperature will 10.0 grams of ammonia, NH₃, exert 700.0 mmHg pressure in an 8.0 L container?
- 10.0 g of gas occupies 8.00 L at STP. What volume would this gas occupy at 273°C and 160.0 kPa?
- A gas measuring 0.50 L at 99.0 kPa and 87°C is heated to 127°C inside a rigid container that can not expand. What is the new pressure of the gas?
- A technology called "MAP" (Modified Atmospheric Packaging) is used to increase the shelf life of meat products. One of the mixtures of gases used for MAP is nitrogen at a partial pressure of 83.6 kPa and carbon dioxide at a partial pressure of 26.4 kPa. What is the total pressure of the gases in the package?