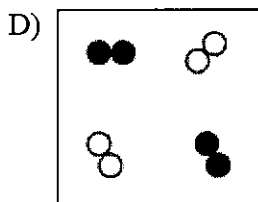
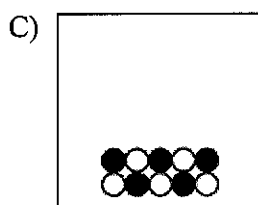
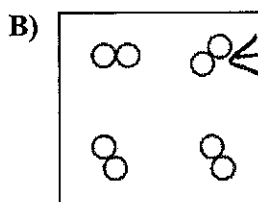
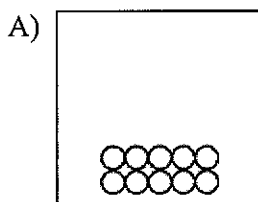
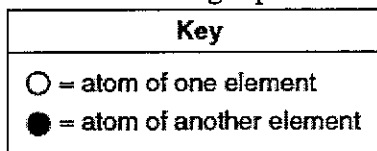


Give a reason for each answer using a word, phrase or picture.

1. Which particle diagram represents one substance in the gas phase?



diatomic element
& spread apart
(gas phase)

2. Which statement describes a chemical property of aluminum?

- A) Aluminum reacts with sulfuric acid.
 B) Aluminum conducts an electric current.
 C) Aluminum has a density of 2.698 g/cm³ at STP.
 D) Aluminum is malleable.

3. Which formula represents a mixture?

- A) LiCl(aq) B) C₆H₁₂O₆(s)
 C) LiCl(s) D) C₆H₁₂O₆(l)

aq means dissolved
in water

4. Which term is defined as a measure of the average kinetic energy of the particles in a sample of matter?

- A) potential energy
 B) activation energy
 C) temperature
 D) entropy

movement
energy

5. What is the equivalent of 0 Kelvin on the Celsius scale?

- A) 273° B) 100°
 C) -273° D) -100°

K = °C + 273
 0 = °C + 273

6. Which phase change represents sublimation?

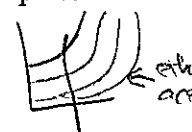
- A) KI(s) → KI(l)
 B) NH₃(l) → NH₃(g)
 C) CO₂(s) → CO₂(g)
 D) H₂O(l) → H₂O(s)

starts @
solid strips
liquid
to gas

7. Which compound has the lowest vapor pressure at 50°C?

- A) water B) propanone
 C) ethanoic acid D) ethanol

Table H

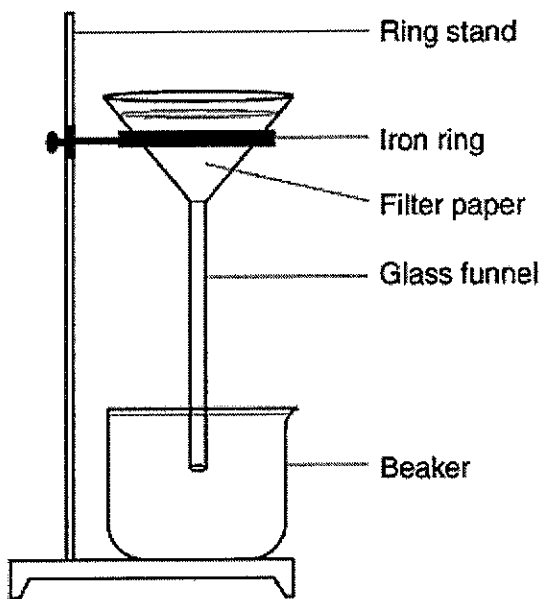


8. Two substances in a mixture differ in density and particle size. These properties can be used to

- A) separate the substances
 B) determine the freezing point of the mixture
 C) chemically combine the substances
 D) predict the electrical conductivity of the mixture

both physical properties
&
mixtures
can be
separated

9. Which mixture can be separated by using the equipment shown below?



- A) $\text{CO}_2(\text{aq})$ and $\text{NaCl}(\text{aq})$
- B) $\text{CO}_2(\text{aq})$ and $\text{C}_6\text{H}_{12}\text{O}_6(\text{aq})$
- C) $\text{NaCl}(\text{aq})$ and $\text{C}_6\text{H}_{12}\text{O}_6(\text{aq})$
- D) $\text{NaCl}(\text{aq})$ and $\text{SiO}_2(\text{s})$

Salt water

large particles
will get stuck in
filter

10. The laboratory process of distillation does not involve

- A) liquids with the same boiling points
- B) changing a vapor to liquid
- C) liquids with different boiling points
- D) changing a liquid to vapor

must be different

11. One similarity between all mixtures and compounds is that both

- A) combine in a definite ratio
- B) are heterogeneous
- C) consist of two or more substances
- D) are homogeneous

must have 2

12. Which substance can be broken down by chemical means?

- A) Ce
- B) Ca
- C) Cu
- D) CO

compound, not element

Number of particles

★ Equal volumes of different gases at the same temperature and pressure contain an equal number of particles.

Standard temperature and pressure (STP)- agreed upon value of temperature and pressure for the sake of comparing gases

★ Temperature: 0°C or 273 K

★ Pressure: 101.3 kPa or 1 atmosphere

$$\frac{(1 \text{ atm})(3 \text{ L})}{273 \text{ K}} = \frac{(0.5 \text{ atm})(x)}{300 \text{ K}}$$

$$1900 = 136.5x$$

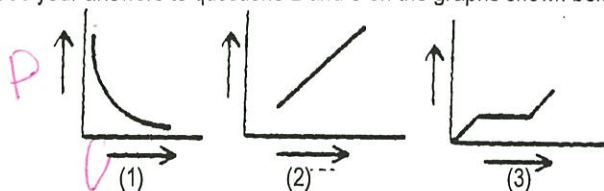
$$x = 6.6 \text{ L}$$

Answer the questions below by circling the number of the correct response

1. A sample of a gas is at STP. As the pressure decreases and the temperature increases, the volume of the gas (1) decreases (2) increases (3) remains the same

1 atm 273 K ↓ P ↑ T ... ↑ T ↑ V

Base your answers to questions 2 and 3 on the graphs shown below.



Note that questions 2 and 3 have only three choices.

2. Which graph best represents how the volume of a given mass of a gas varies with the Kelvin temperature at constant pressure?

3. Which graph best represents how the volume of a given mass of a gas varies with the pressure on it at constant temperature.

4. A 100. milliliter sample of a gas at a pressure of 50.8 kPa is reduced to 25.4 kPa at constant temperature. What is the new volume of the gas? (1) 50.0 mL (2) 90.0 mL (3) 200. mL (4) 290. mL

5. At STP, which gas would most likely behave as an ideal gas? (1) H₂ (2) CO₂ (3) C₁₂ (4) SO₂

Smallest = least attraction

6. At constant temperature the pressure on 8.0 liters of a gas is increased from 1 atmosphere to 4 atmospheres. What will be the new volume of the gas? (1) 1.0 l (2) 2.0 l (3) 32 l (4) 4.0 l

7. As the temperature of a sample of gas decreases constant pressure, the volume of the gas (1) decreases (2) increases (3) remains the same

8. A 100 milliliter sample of a gas is enclosed in cylinder under a pressure of 101.3 kPa. What volume would the gas sample occupy at a pressure of 202.6 kPa, temperature remaining constant? (1) 50. mL (2) 100 mL (3) 200 mL (4) 380 mL

9. The volume of a sample of hydrogen gas at STP is 1.00 liter. As the temperature decreases, pressure remaining constant, the volume of the sample (1) decreases (2) increases (3) remains the same

10. The pressure on 200. milliliters of a gas at constant temperature is changed from 0.500 atm to 1.00 atm. The new volume of the gas is (1) 100. mL (2) 200. mL (3) 400. mL (4) 600. mL

11. As the pressure on a given sample of a gas increases at constant temperature, the mass of the sample (1) decreases (2) increases (3) remains the same

12. A gas sample is at 10.0°C. If pressure remains constant, the volume will increase when the temperature is changed to (1) 263 K (2) 283 K (3) 273 K (4) 293 K

283K = 10°C
↑ when temp ↑

$$\rightarrow (100 \text{ mL})(101.3 \text{ kPa}) = x(202.6 \text{ kPa})$$

$$10130 = 202.6x$$

$$x = 50 \text{ mL}$$

$$\rightarrow (200 \text{ mL})(0.5 \text{ atm}) = (1 \text{ atm})x$$

$$100 \text{ mL} = x$$

$$(100 \text{ mL})(50.8 \text{ kPa}) = (25.4 \text{ kPa})(x)$$

$$5080 = 25.4x$$

$$x = 200 \text{ mL}$$

$$P_1V_1 = P_2V_2$$

$$(8 \text{ L})(1 \text{ atm}) = (4 \text{ atm})x$$

$$2 = x$$