

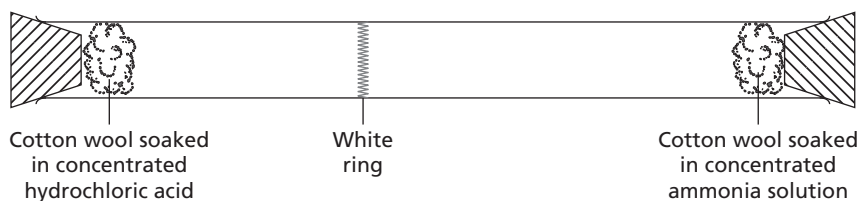
Section A: Principles of Chemistry

A1 States of Matter

- 1 Which of the following is NOT a feature that supports the particulate theory of matter?
- (A) There are empty spaces between the particles. (A)
 - (B) The particles are in constant motion. (B)
 - (C) There are no forces of attraction between the particles. (C)
 - (D) Temperature has an effect on the speed of motion of the particles. (D)

Items 2–3 refer to the following information.

A piece of apparatus was set up as illustrated below and a white ring quickly formed in the tube.

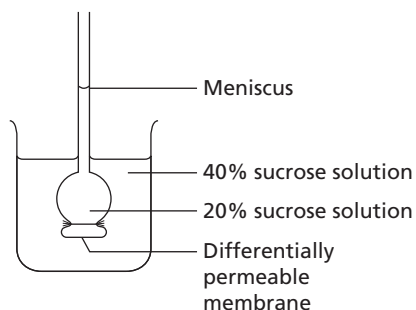


- 2 Which of the following equations correctly represents the reaction that formed the white ring?
- (A) $\text{NH}_3(\text{aq}) + \text{HCl}(\text{aq}) \longrightarrow \text{NH}_4\text{Cl}(\text{g})$ (A)
 - (B) $\text{NH}_3(\text{g}) + \text{HCl}(\text{g}) \longrightarrow \text{NH}_4\text{Cl}(\text{g})$ (B)
 - (C) $\text{NH}_3(\text{aq}) + \text{HCl}(\text{aq}) \longrightarrow \text{NH}_4\text{Cl}(\text{s})$ (C)
 - (D) $\text{NH}_3(\text{g}) + \text{HCl}(\text{g}) \longrightarrow \text{NH}_4\text{Cl}(\text{s})$ (D)
- 3 The white ring formed in the position shown because
- (A) ammonia molecules diffuse faster than hydrogen chloride molecules (A)
 - (B) ammonia molecules are heavier than hydrogen chloride molecules (B)
 - (C) hydrogen chloride molecules possess more kinetic energy than ammonia molecules (C)
 - (D) hydrogen chloride molecules diffuse faster than ammonia molecules (D)

A1 States of Matter (cont.)

- 4 Which of the following BEST describes what happens during osmosis?
- (A) Molecules move from a dilute solution to a more concentrated solution through a differentially permeable membrane. (A)
 - (B) Water molecules diffuse from a dilute solution to a concentrated solution. (B)
 - (C) Water molecules move through a differentially permeable membrane from a dilute solution to a concentrated solution. (C)
 - (D) Water molecules diffuse from a concentrated solution to a dilute solution through a differentially permeable membrane. (D)
- 5 A strip of paw-paw is placed in a beaker of water. After 30 minutes it was found that the strip had
- (A) increased in length and become rigid (A)
 - (B) increased in length and become soft (B)
 - (C) decreased in length and become rigid (C)
 - (D) decreased in length and become soft (D)

Item 6 refers to the piece of apparatus in the diagram below.



- 6 After 30 minutes the meniscus would have
- (A) moved up (A)
 - (B) moved down (B)
 - (C) remained in the same position (C)
 - (D) moved up for a while and then moved down (D)

- 7** Sodium chloride can be used to preserve meat because
- I** it draws water out of the cells of the meat by osmosis
 - II** it is toxic to bacteria and fungi
 - III** it inhibits the growth of microorganisms by causing water to enter their cells
- (A) I only (A)
- (B) II only (B)
- (C) I and III only (C)
- (D) I, II and III (D)
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- 8** In a gas, the particles
- (A) have small spaces between them (A)
- (B) possess very little kinetic energy (B)
- (C) vibrate in their fixed positions (C)
- (D) are attracted to each other by weak forces (D)
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- 9** Compared to the particles in liquids, the particles in solids
- (A) have more space between them (A)
- (B) have less kinetic energy (B)
- (C) move faster (C)
- (D) have weaker forces of attraction between them (C)