

Chapter 12 Water and Solution

Paper 1

Answer **all** questions. Each question is followed by four options, **A, B, C and D**. For each question, choose **one** answer only.

1. Solution X shows the characteristics below:

• Freezing point	0 °C
• Boiling point	100 °C
• pH value	7
• Density	1 g/ml

Among the following, which is X?

- A Ether
- B Alcohol
- C Vinegar
- D Distilled water

2. When zinc is put into solution X, a gas that produces a 'pop' sound with a burning wooden splinter is released. Solution X could possibly be

- A nitric acid
- B ammonia
- C calcium hydroxide solution
- D sodium hydroxide solution

3.

- | |
|--------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• pH value of 2• changes the colour of blue litmus paper to red |
|--------------------------------------------------------------------------------------------------------------------------|

The table above shows the properties of substance X. Among the following, which could possibly be substance X?

- A Toothpaste
- B Lime juice
- C Limewater
- D Soap solution

4. Among the following factors, which does **not** influence the rate of solubility?

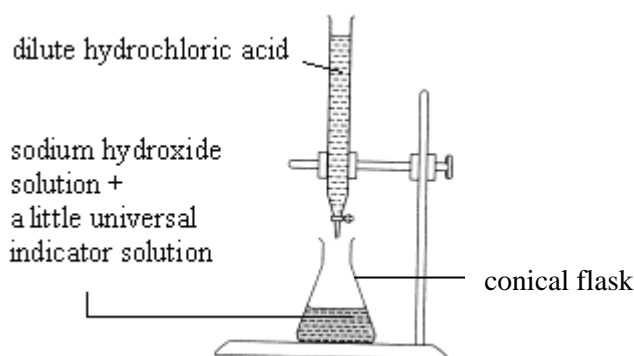
- A Temperature of solvent
- B Size of solutes
- C Size of container

D Rate of stirring

5. A certain amount of dilute acid is electrolysed using platinum electrodes as anode and cathode. What are the gases formed at the anode and cathode?

	<i>Anode</i>	<i>Cathode</i>
A	Hydrogen	Oxygen
B	Oxygen	Chlorine
C	Hydrogen	Nitrogen
D	Oxygen	Hydrogen

6.



Dilute hydrochloric acid in the diagram above is flowed into the solution in the beaker until its colour turns green. Which of the following is the property of the solution formed in the conical flask?

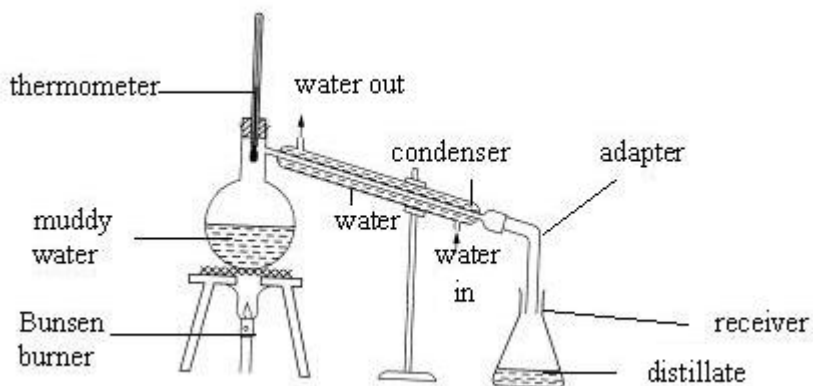
- A** Tastes salty
 - B** Tastes sour
 - C** Corrosive
 - D** pH value of 6
7. The following are four steps that are involved in water purification at the water treatment plant.

P - Sedimentation
Q - Coagulation
R - Filtration
S - Chlorination

Which of the following shows the correct sequence of steps?

- A** Q, R, P, S
- B** P, Q, R, S
- C** Q, P, R, S
- D** R, Q, P, S

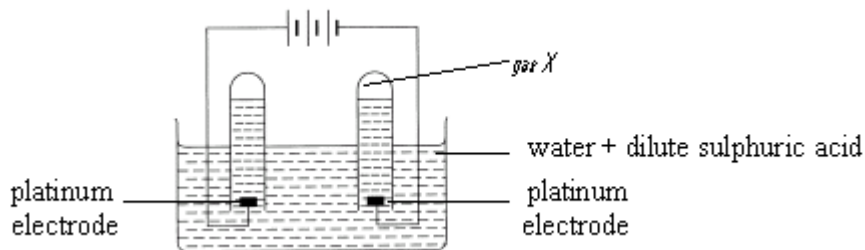
8.



The diagram above shows the apparatus set-up of water purification through distillation. Which of the following statement is **true**?

- A Boiling occurs in condenser
- B Condensation occurs in round bottomed flask
- C The distillate only contains pure water
- D The distillate contains suspended particles

9.



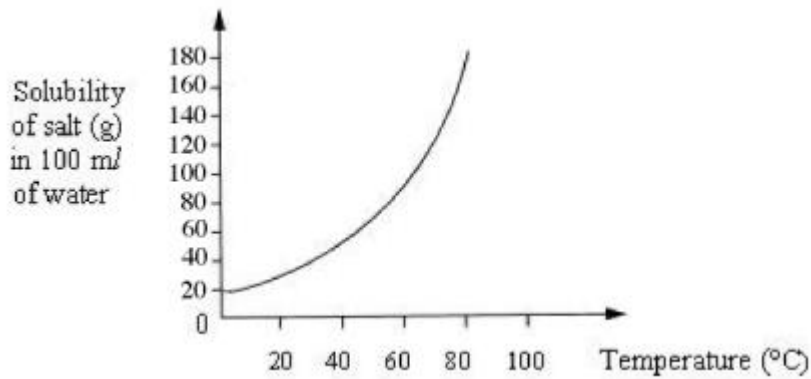
The above diagram shows the process of electrolysis. What is the characteristic of gas X collected in the test tube?

- A Has a pungent smell
- B Supports burning
- C Acidic in nature
- D Produces a 'pop' sound when tested with a lighted wooden splinter

10. In a method of water purification, the water produced have a melting point of 0 °C and boiling point of 100 °C. Of the following, which is this method?

- A Filtration
- B Distillation
- C Boiling
- D Chlorination

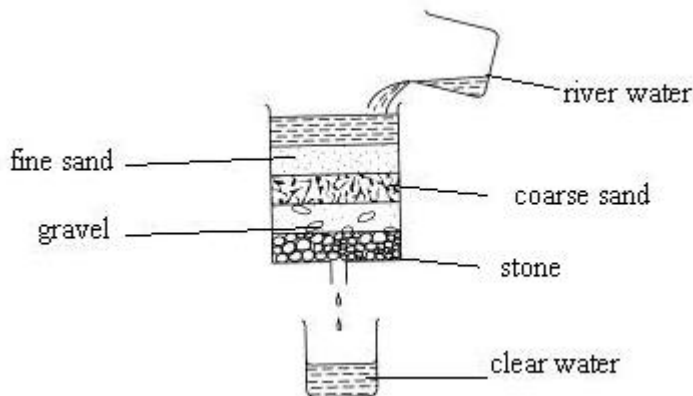
11.



The diagram above shows a graph of solubility of salt X in 100 ml of water against temperature. What is the solubility of salt X at a temperature of 80 °C?

- A 40 g
- B 100 g
- C 160 g
- D 180 g

12.

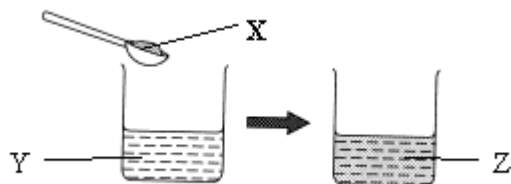


The diagram above shows a process of water purification. Which of the following can be found in the clear water collected?

- I Suspended substances
- II Mineral salts
- III Microorganisms

- A I only
- B I and II only
- C II and III only
- D I, II, and III

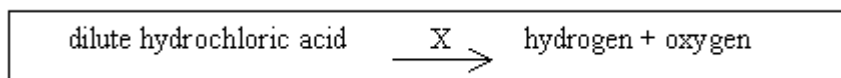
13.



The diagram above shows the production of substance Z. Which of the following represents substances X, Y and Z?

	X	Y	Z
A	Solute	Solvent	Solution
B	Solvent	Solution	Solute
C	Solvent	Solute	Solution
D	Solution	Solute	Solvent

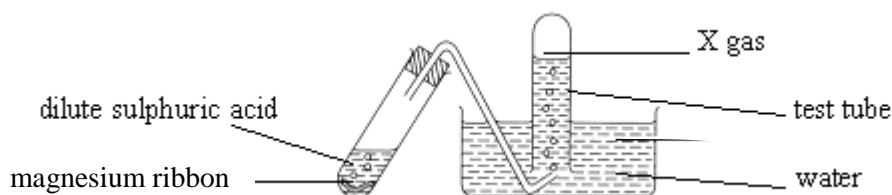
14.



Among the following, which is process X that can be used to produce hydrogen and oxygen from dilute hydrochloric acid?

- A Evaporation
- B Electrolysis
- C Crystallisation
- D Distillation

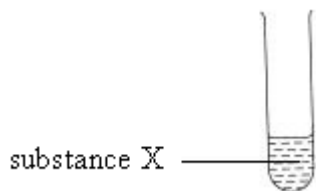
15.



The diagram above shows an experiment that is carried out to study the reaction between dilute sulphuric acid and magnesium. Among the following, which can be used to confirm gas X that is produced?

- A Limewater
- B Bicarbonate indicator
- C Glowing wooden splinter
- D Burning wooden splinter

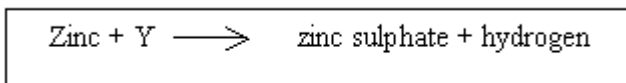
16.



When a little water is poured into the test tube in the diagram above, it is observed that a solution, which changes red litmus paper to blue, is formed. What is substance X ?

- A Hydrochloric acid
- B Solid sodium chloride
- C Solid sodium hydroxide
- D Solid ammonium chloride

17.



The chemical equation above shows the reaction between pieces of zinc with solution Y.
Solution Y

- I has sour taste
- II has a pH value of more than 7
- III neutralises alkali to form salt and water

- A I and II only
- B I and III only
- C II and III only
- D I, II, and III

18. Among the following chemicals, which are added to the water in a water treatment plant?

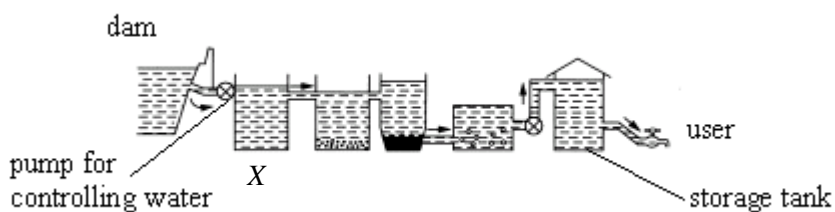
- I Alum
 - II Slaked lime
 - III Chlorine
-
- A I only
 - B I and II only
 - C II and III only
 - D I, II, and III

19. Among the following methods, which can be used to confirm the presence of acid?

- I Reaction with zinc that releases hydrogen
- II Reaction with marble that releases carbon dioxide
- III Reaction with ammonium salt that releases nitrogen

- A I and II only
- B I and III only
- C II and III only
- D I, II, and III

20.



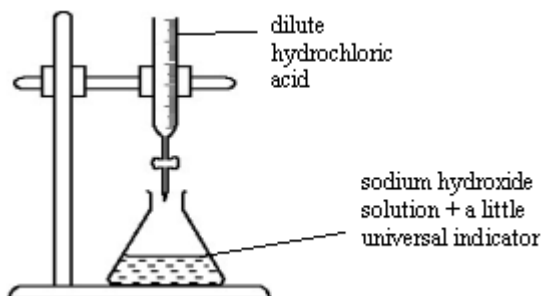
The diagram above shows the stages in a water treatment plant. Among the following, which substance are added in the tank X?

- I Slaked lime
- II Alum
- III Chlorine

- A I and II only
- B I and III only
- C II and III only
- D I, II, and III

Paper 2

Answer the question.



Dilute hydrochloric acid is added into the solution in the conical flask as shown in the figure above, until the solution turns green.

(a) What is the property of the solution in the conical flask

(i) before the solution turns green?

(ii) at the point when the solution starts to turn green?

(b) Name the process which occurs when hydrochloric acid is dropped into the sodium hydroxide solution and reacts with it.

(c) Name the method used in the experiment.

(d) Write a chemical equation in words for the reaction between hydrochloric acid and sodium hydroxide.

(e) If universal indicator is replaced by phenolphthalein indicator in this experiment, state the change of colour of solution in the conical flask.

Answers:

Paper 1

1	D	11	D
2	A	12	C
3	B	13	A
4	C	14	B
5	D	15	D
6	A	16	C
7	C	17	B
8	C	18	D
9	D	19	A
10	B	20	A

Paper 2

- (a) (i) Alkali (ii) Neutral
- (b) Neutralisation
- (c) Titration
- (d) Sodium hydroxide + hydrochloric acid \rightarrow sodium chloride + water
- (e) From pink to colourless