

NameCentre No.....

545/1

CHEMISTRY

PAPER 1

JULY/AUGUST.2023

1 ½ HOURS



Uganda Certificate of Education

SHAPTA JOINT ASSESSMENT BOARD 2023

CHEMISTRY

PAPER 1

TIME: 1 ½ HOURS

INSTRUCTIONS TO CANDIDATES:

- This paper consists of 50 objective – type questions
- Answer all questions
- You are required to write the correct answer A, B, C or D in the box provided on the right hand side of each question.
- Use pen and write clearly

1. Which one of the following is the best method of separating a mixture of potassium chloride and charcoal?
- A. Distillation
 - B. Magnetisation
 - C. Sublimation
 - D. Filtration
2. Which one of the following substances will give up its water of crystallisation to the atmosphere when left in damp air?
- A. Hydrated copper(II) sulphate
 - B. Hydrated sodium carbonate
 - C. Phosphorus(V) oxide
 - D. Sodium hydrogencarbonate
3. The reddish brown coating formed when iron is left in moist air for a long time is
- A. Hydrated iron(III) oxide
 - B. Hydrated iron(II) oxide
 - C. Anhydrous iron(III) oxide
 - D. Anhydrous iron(II) oxide
4. Which one of the following is a crystalline form of carbon?
- A. Diamond
 - B. Lampblack
 - C. Coal
 - D. Soot
5. Nitric acid prepared in the laboratory is pale yellow because;
- A. It contains dissolved Nitrogen(IV) oxide
 - B. It is less concentrated
 - C. It is highly concentrated
 - D. It contains dissolved nitrogen(II) oxide
6. Which one of the following is used in the manufacture of glass?
- A. Sodium carbonate
 - B. Calcium carbonate
 - C. Sodium hydrogencarbonate
 - D. Calcium hydrogencarbonate

7. Which one of the following substances is produced when hydrogen chloride is passed over heated iron?
- A. Oxygen
 - B. Steam
 - C. Hydrogen
 - D. Chlorine
-
8. When 5.74g of a hydrated salt X was heated, 3.22g of the anhydrous salt Y was formed. The number of moles of water of crystallisation is (Y = 161, O = 16, H = 1)
- A. 2
 - B. 5
 - C. 7
 - D. 10
-
9. The product formed after passing sulphur dioxide through calcium hydroxide solution is used for
- A. Bleaching the pulp in paper industry
 - B. Vulcanisation of rubber
 - C. Killing bacteria during water purification
 - D. Improving soils as a fertiliser
-
10. Which one of the following compounds dissolves in water to form a solution with pH 7?
- A. NaHCO_3
 - B. Na_2CO_3
 - C. CH_3COONa
 - D. NaCl
-
11. Which one of the following is observed when concentrated nitric acid is added to iron(II) sulphate solution?
- A. Brown precipitate
 - B. White precipitate
 - C. Brown solution
 - D. Colourless solution
-

12. 2.0g of sodium hydroxide was dissolved in water to make 500 cm³ of solution. The molarity of the solution is

(Na = 23, O = 16, H = 1)

- A. 2M
- B. 0.1M
- C. 0.5M
- D. 0.05M

13. Copper(II) carbonate can best be prepared by

- A. Direct synthesis
- B. Neutralisation
- C. Displacement
- D. Precipitation

14. Which one of the following substances is not added into the blast furnace during the extraction of iron?

- A. Air
- B. Coke
- C. Limestone
- D. Carbon monoxide

15. Magnesium reduces the oxide of Y and Y displaces copper from its salts. Which one of the following is the order of reactivity of the metals starting with the most reactive?

- A. Cu > Y > Mg
- B. Mg > Cu > Y
- C. Mg > Y > Cu
- D. Y > Mg > Cu

16. Which one of the following oxides can react with potassium hydroxide solution?

- A. CuO
- B. CaO
- C. FeO
- D. PbO

17. Which one of the following chlorides can best be prepared in the anhydrous form by passing dry hydrogen chloride over the heated metal?

- A. CuCl_2
- B. FeCl_2
- C. FeCl_3
- D. AlCl_3

18. Which one of the following ions when reacted with aqueous Lead(II) nitrate forms a precipitate which dissolves on heating?

- A. OH^-
- B. SO_4^{2-}
- C. Cl^-
- D. CO_3^{2-}

19. The number of moles of hydroxide ions contained in 10g of calcium hydroxide

(Ca = 40, O = 16, H = 1)

- A. 0.135
- B. 0.175
- C. 0.270
- D. 0.350

20. Which one of the following substances is formed as a solid when a bottle of lime water is left open for a long time?

- A. $\text{Ca}(\text{HCO}_3)_2$
- B. $\text{Ca}(\text{OH})_2$
- C. CaO
- D. CaCO_3

21. Which one of the following is not a property of hydrogen chloride?

- A. It forms a white precipitate with silver nitrate
- B. It turns moist blue litmus paper red
- C. It forms white fumes with Ammonia gas
- D. It bleaches coloured flowers

22. Which one of the following pairs of cations when in solution can be distinguished using potassium iodide solution?

A. Pb^{2+} and Al^{3+}

B. Zn^{2+} and Al^{3+}

C. Zn^{2+} and Fe^{2+}

D. Fe^{2+} and Fe^{3+}

23. Which one of the following is the relative molecular mass of the gas if 8.4 dm³ of the gas has a mass of 0.93g at s.t.p?

A. $\frac{0.93 \times 22.4}{8.4}$

B. $\frac{22.4 \times 8.4}{0.93}$

C. $\frac{0.93 \times 8.4}{22.4}$

D. $\frac{0.93}{22.4 \times 8.4}$

24. The product given off at the positive electrode when an aqueous solution of Copper(II) sulphate is electrolysed using platinum electrodes is

A. Oxygen

B. Hydrogen

C. Copper

D. Sulphur dioxide

25. An ion X^{2-} contains 18 electrons. The group and period to which X belongs in the periodic table is

A. II and 2

B. II and 3

C. VI and 2

D. VI and 3

26. To an aqueous solution of W, Magnesium sulphate solution was added, there was no observable change, and the resultant solution was boiled in a boiling tube. A white precipitate was observed. The anion present in W is

A. Carbonate

B. Hydrogen sulphite

C. Hydrogen sulphate

D. Hydrogen carbonate

27. Which one of the following processes does not involve electrolysis?

- A. Extraction of Iron
- B. Extraction of copper
- C. Manufacture of NaOH
- D. Manufacture of chlorine

28. In which of the following reactions does sulphuric acid act as a dehydrating agent? Reaction with

- A. Copper
- B. Zinc carbonate
- C. Sugar
- D. Sodium chloride

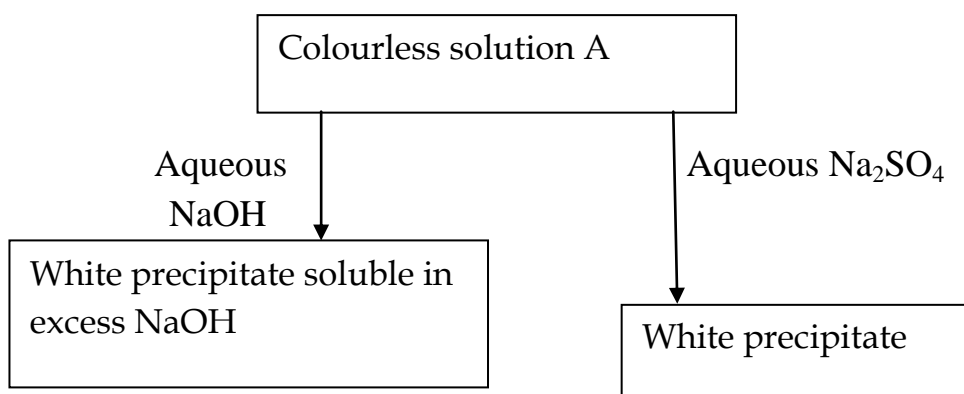
29. Sulphur dioxide burns in air according to the following equation:



The volume of sulphur dioxide that burns when 50 cm^3 of sulphur dioxide was combined with 20 cm^3 of oxygen is

- A. 40 cm^3
- B. 20 cm^3
- C. 50 cm^3
- D. 25 cm^3

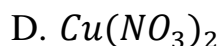
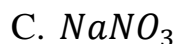
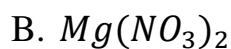
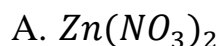
30. Study the flow diagram below:



The cation in solution A is most likely to be

- A. Al^{3+}
- B. Mg^{2+}
- C. Ca^{2+}
- D. Pb^{2+}

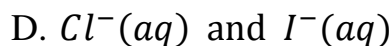
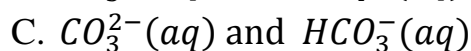
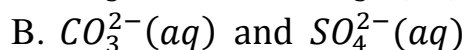
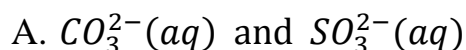
31. Which one of the nitrates listed below does not produce an oxide when heated?



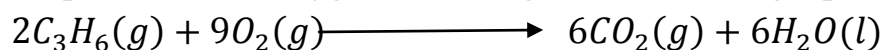
32. An oxide of an element is made up of 50% M. The simplest formula of the oxide is; (M = 32, O = 16)



33. Which one of the following pairs of ions can be distinguished using acidified Barium solution?

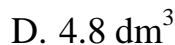
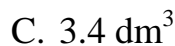
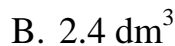
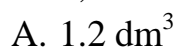


34. Propene burns in oxygen according to the following equation:



When 2.1g of propene is completely burnt in oxygen, the volume of carbon dioxide produced at room temperature is

(C = 12, H = 1)



35. Which one of the following is NOT true about atoms $^{12}_6Z$ and $^{14}_6Y$?

A. They have same number of neutrons

B. They have the same number of protons

C. They are atoms of same element

D. They have the same number of electrons

36. One of the following best describes a mixture of water and chalk.

- A. Precipitate
- B. Suspension
- C. Solution
- D. Fume

37. Identify the elements present in the compound with the chemical formula $Ca_3(PO_4)_2$.

- A. Calcium, phosphorus, oxygen
- B. Potassium, calcium, oxygen
- C. Calcium, phosphate, oxygen
- D. Carbon, phosphorus, oxygen

38. Which one of the following metals will react with oxygen to form an amphoteric oxide?

- A. Zinc
- B. Iron
- C. Copper
- D. Magnesium

39. Which of the following gases diffuses faster?

- A. CO_2
- B. CH_4
- C. NO_2
- D. NH_3

40. Which one of these is not a factor that affects discharge of an ion during electrolysis?

- A. Nature of electrode
- B. Position of the element in the reactivity series
- C. The nature of the crystals of the compound
- D. Concentration of the electrolyte

Each of the questions 41 – 45 consists of an assertion (statement) on the left hand side and a reason on the right hand side. Select as follows:

- A. If both assertion and reason are **true** statements and the reason is the **correct** explanation of the assertion.
- B. If both assertion and reason are **true** statements but the reason is **not** the **correct** explanation of the assertion.
- C. If the assertion is **true** but the reason is **not** a correct statement.
- D. If the assertion is **not** correct but the reason is a correct statement.

Instructions summarised

| Assertion | Reason |
|--------------|--|
| A. True | True (reason is a correct explanation) |
| B. True | True (reason is not a correct explanation) |
| C. True | Incorrect |
| D. Incorrect | Correct |

| | | |
|---|----------------|--|
| 41. When sulphur dioxide is bubbled through concentrated Nitric acid brown fumes are observed | Because | <div> sulphur dioxide reduces concentrated nitric acid to nitrogen(II) oxide <div></div> </div> |
| 42. Manganese(IV) oxide reacts with concentrated Hydrochloric acid to produce chlorine gas | Because | <div> Manganese(IV) oxide is a basic oxide <div></div> </div> |
| 43. During the electrolysis of Concentrated sodium chloride Solution, chlorine is liberated At the anode | Because | <div> the chloride ion is higher than the hydroxide ion in the electrochemical series <div></div> </div> |
| 44. When excess ammonia solution is added to copper(II) chloride solution, a deep blue solution is formed | Because | <div> Copper(II) hydroxide is a soluble base <div></div> </div> |

45. Concentrated sulphuric acid
does NOT conduct
electricity

Because

it has a
great affinity
for water

**In each of the questions 46 – 50, one/ more of the answers may be correct.
Read each question carefully and then indicate the correct answer as: A, B,
C or D according to the following:**

- A. If 1, 2 and 3 only are correct
- B. If 1 and 3 only are correct
- C. If 2 and 4 only are correct
- D. If 4 only is correct

46. Which of the following substances can be used to produce sulphur dioxide?

- 1. Sulphur
- 2. Copper
- 3. Sodium sulphite
- 4. Sodium sulphate

47. Which of the following nitrates will form Nitrogen dioxide when strongly heated?

- 1. Calcium nitrate
- 2. Sodium nitrate
- 3. Copper(II) nitrate
- 4. Ammonium nitrate

48. The products of reaction of chlorine with cold dilute sodium hydroxide are;

- 1. H_2O
- 2. NaCl
- 3. NaOCl
- 4. NaClO_3

49. The following substances are formed when ammonium nitrate is strongly heated.

- 1. Nitrogen
- 2. Dinitrogen oxide
- 3. Ammonia
- 4. Steam

50. Which of the following substances is/are formed when copper(II) sulphate is electrolysed using platinum anode and copper cathode?

1. Copper is deposited at the cathode
2. Hydrogen is liberated at the cathode
3. Oxygen is liberated at the anode
4. Copper(II) ions are liberated at the cathode

☐

END

