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S5052 June W.A.S.S.C.E. 2006 CHEMISTRY 2 3 hours

Index Number:....

THE WEST AFRICAN EXAMINATIONS COUNCIL West African Senior School Certificate Examination

June 2006

CHEMISTRY 2

Do not open this booklet until you are told to do so. While you are waiting, write your name and index number in the spaces provided at the top right-hand corner of this booklet and thereafter, read the following instructions carefully. This paper consists of two parts, A and B. Answer Part A on your Objective Test answer sheet and Part B in your answer booklet. Part A will last for 1 hour after which the answer sheet will be collected. Do not start Part B until you are told to do so. Part B will last for

PART A **OBJECTIVE TEST** [50 marks]

Use HB pencil throughout.

If you have got a blank answer sheet, complete the top section as follows.

(a) In the space marked Name, write in capital letters your surname followed by your other

(b) In the spaces marked Examination, Year, Subject and Paper, write 'W.A.S.S.C.E.', '2006 June', 'CHEMISTRY' and '2' respectively.

(c) In the box marked Index Number, write your index number vertically in the spaces on the left-hand side. There are numbered spaces in line with each digit. Shade carefully the space with the same number as each digit.

(d) In the box marked Paper Code, write the digits 505213 in the spaces on the left-hand side. Shade the corresponding numbered spaces in the same way as for your index number.

(e) In the box marked Sex, shade the space marked M if you are male, or F if you are female. 3. If you have got a pre-printed answer sheet, check that the details are correctly printed, as described in 2 above. In the boxes marked Index Number, Paper Code and Sex, reshade each of the shaded

An example is given below. This is for a male candidate, whose name is Chukwuma Adekunle Ciroma, whose index number is 4251102068 and who is offering Chemistry 2.

WEST AFRICAN EXAMINATIONS

PRINT IN BLOCK LETTERS Name: CIROMA CHUKWUMA ADEKUNLE Examination: WASSCE Year: 2006 JUNE Other Names Paper: CHEMISTRY Subject: SEX PAPER CODE INDEX NUMBER 5 -03-13-23-23-43-63-63-73-83-93 Indicate your sex by c03c13c23c33mmc53c63c73c83c93 C13C23C43C53C63C73C83C93 shading the space c0=c1=====c3=c4=c5=c6=c7=c8=c9= marked M (for Male) 5 -03-13-23-23-43-63-63-73-83-93 c0>c1>c2>c3>c4> === c6>c7>c8>c9> or F (for Female) in 2 -03-13-63-33-43-53-63-73-83-93 c03.00 c23c33c43c53c63c73c83c93 this box: M c03 == c23 c3 c4 c5 c6 c6 c7 c8 c9 c c03 = c23 c33 c43 c53 c62 c73 c83 c93 3 =03=13=23 ===== =43=53=63=73=83=93 ₩ =13=23=33=43=53=63=73=83=93 c03c13 6 c33c43c53c63c73c83c93 INSTRUCTIONS TO CANDIDATES 1. Use grade HB pencil throughout 1. Use grade HB pencil inroughout.
2. Answer each question by choosing one letter and shading it like this: [A] [B] [C]

3. Erase completely any answers you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need. **■** =13=23=33=43=53=63=73=83=93 c03c13c23c33c43c53mmc73c83c93 8 000010020030040050060070000090 Do not make any markings across the heavy black marks at the right-hand edge of For Supervisors only. If candidate is absent shade this space: your answer she © 2006 The West African Examinations Council

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| Ans | wer all the questions. |
|-----------------------|--|
| ques | Each question is followed by four options lettered A to D. Find out the correct option for eastion and shade in pencil on your answer sheet, the answer space which bears the same letter option you have chosen. Give only one answer to each question. An example is given below. |
| Whi | ch of the following elements reacts with water? |
| 311 | A. Carbon B. Iodine C. Sodium D. Sulphur |
| The | correct answer is Sodium, which is lettered C and therefore answer space C would be shaded. |
| | [A] [B] [D] |
| Thin | k carefully before you shade the answer spaces; erase completely any answer you wish to chang |
| | all rough work on this question paper. The standard the second for |
| | Wilder State Committee of the Manual Andrew Service and Andrew Service |
| ivou | answer the jouowing questions. |
| 1. | How many orbitals are in the d-sub shell? |
| | (e) In the box harked Index Mundy write your bules number verifically is A. A. I see eve numbered spaces in the with each diett, Shade care if the B. |
| | |
| | D. State of the second of the |
| | C. a. 5 led Silver as here add in the 2000 of igns extractive about 10 mg to the proof and in the contractive about 10 mg to 10 mg. |
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| 2. | C. 5 1 and the state of the sta |
| uh); 2. | C. 5 C. |
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| zion 2. la Janu | C. 5 1 2 2 2 2 2 2 2 2 2 |
| | C. 5 1 2 2 2 2 2 2 2 2 2 |
| Jmi | C. 5 D. 7 An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. 6.0 B. 6.1 C. 6.9 D. 7.0 |
| J.mi | C. 5 D. 7 An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. '6.0 B. 6.1 C. 6.9 D. 7.0 An atom ²³⁸ An atom |
| 3. | C. 5 D. 7 An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. '6.0 B. 6.1 C. 6.9 D. 7.0 An atom '238 X decays by alpha particle emission to give an atom Y. The atomic number at mass number of Y are |
| 3. | C. 5 D. 7 An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. '6.0 B. 6.1 C. 6.9 D. 7.0 An atom '238 X decays by alpha particle emission to give an atom Y. The atomic number at mass number of Y are A. 90 and 234 respectively. |
| 3. | C. 5 D. 7 An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. 6.0 B. 6.1 C. 6.9 D. 7.0 An atom 238 X decays by alpha particle emission to give an atom Y. The atomic number at mass number of Y are A. 90 and 234 respectively. B. 91 and 238 respectively. |
| 3. | C. 5 D. 7 An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. '6.0 B. 6.1 C. 6.9 D. 7.0 An atom ²³⁸ / ₉₂ X decays by alpha particle emission to give an atom Y. The atomic number at mass number of Y are A. 90 and 234 respectively. B. 91 and 238 respectively. C. 92 and 236 respectively. |
| 3. | C. 5 D. 7 An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. 6.0 B. 6.1 C. 6.9 D. 7.0 An atom ²³⁸ / ₉₂ X decays by alpha particle emission to give an atom Y. The atomic number at mass number of Y are A. 90 and 234 respectively. B. 91 and 238 respectively. C. 92 and 236 respectively. D. 93 and 238 respectively. |
| 33. | C. 5 D. 7 An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. '6.0 B. 6.1 C. 6.9 D. 7.0 An atom ²³⁸ / ₉₂ X decays by alpha particle emission to give an atom Y. The atomic number at mass number of Y are A. 90 and 234 respectively. B. 91 and 238 respectively. C. 92 and 236 respectively. D. 93 and 238 respectively. An element with mass number 133 and atomic number 55 has |
| 3. | An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. '6.0 B. 6.1 C. 6.9 D. 7.0 An atom '238 X decays by alpha particle emission to give an atom Y. The atomic number at mass number of Y are A. 90 and 234 respectively. B. 91 and 238 respectively. C. 92 and 236 respectively. An element with mass number 133 and atomic number 55 has A. 55 electrons and 55 neutrons. |
| 3. | C. 5 bland D. 7 An element X has isotopic masses of 6 and 7. If the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. '6.0 B. 6.1 C. 6.9 D. 7.0 An atom '238 X decays by alpha particle emission to give an atom Y. The atomic number at mass number of Y are A. 90 and 234 respectively. B. 91 and 238 respectively. C. 92 and 236 respectively. D. 93 and 238 respectively. An element with mass number 133 and atomic number 55 has A. 55 electrons and 55 neutrons. B. 55 electrons and 78 neutrons. |
| 3. | C. 5 let be described as a solution of the relative abundance is 1 to 12.5 respective what is the relative atomic mass of X? A. 6.0 B. 6.1 C. 6.9 D. 7.0 An atom 238 X decays by alpha particle emission to give an atom Y. The atomic number at mass number of Y are A. 90 and 234 respectively. B. 91 and 238 respectively. C. 92 and 236 respectively. D. 93 and 238 respectively. An element with mass number 133 and atomic number 55 has A. 55 electrons and 55 neutrons. |

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| | Visit William Cause III and Cause Guest Gu |
|--------------|--|
| | 3 |
| 5. | Which of the following pairs of species contains the same number of electrons? |
| and the same | [6C, 8O, 10Ne, 11Na, 12Mg, 13Al, 13Cl] min normbers and ni 1+ lu sons affinA |
| | A. Mg2+ more server of the same tripabet of outermost electrons in the respect to the same and the same between successive members of 14 and 14 and 14 and 14 and 15 and 15 and 15 and 16 and 1 |
| | D. 'Or respect the same sures of election shells in the respective atom and blan CI and Ne respective atom of the same shells in the respective atom of the same shells. |
| 25.00 | C. Nat and Mg |
| 2.01 | D. C and O ² — suppress own of to nontenion on the desired of a visit a sharp quo |
| 6. | An element X has electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$. |
| | To which group of the periodic table does X belong? |
| 1 | A. I He 2 3 |
| | B. II |
| 976 | What ever of bond will be formed between sidments? and the Bort lectron again im all Se |
| 17 | D. IV . A G Ma A C S D C C C C C C C C C C C C C C C C C |
| | A. Covalem bond |
| 7. | Which of the following sets of elements is arranged in order of increasing first ionization energies |
| | A. 11Na, 3Li, 19K, 37Rb |
| | D Db W I; No |
| · sit | B. 37Rb, 19K, 3Li, 11Na to non-protein as bevious as subnect as missed by agriculture. |
| | C. ₃ Li, ₁₉ K, ₁₁ Na, ₃₇ Rb |
| 7 7 13 | D. 37Rb, 19K, 11Na, 3Li |
| | |
| 8. | Which of the following electronic configurations represent that of a noble gas? |
| | A. 2, 8, 8, 2 |
| | B. 2, 6, 2 |
| | A. Attraction between the delocalized electrons and fixed positive latifectpoints 8, 2 on 2. B. Attraction between positive and negative ions |
| | D. 2, 6 mbt din 3 Sharing of electrons between the metal atoms |
| √9. | Diamond is a hard substance because its carbon atoms are held by to the local and a diament. |
| 1 | A. delocalised electrons. Our of any and a set that have a set of the polynomer set would set of the |
| | B. strong electrostatic forces |
| | C. van der Waals forces. |
| | D. strong directional covalent bonds. |
| 10 | The programs of provincial electrons in an etc. of all 1.1.1.1. |
| 10. | A 112 (6) A 1 |
| 1 | A ductility |

Which of the letters indicate elements which exist as diatomic gases?

lustre.

C. malleability.

D. paramagnetism.

B.

Obas H . A

C. Cand A.

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| | 11. | Elements w | nich bel | ong to the | same group | in the periodic | 411 | |
|---|-----|------------|----------|------------|------------|-----------------|--------------|----------------|
| 1 | | | | 8 | sume group | in the periodic | table are ch | aracterized by |

- difference of +1 in the oxidation numbers of successive members.
- presence of the same number of outermost electrons in the respective atoms.
- difference of 14 atomic mass units between successive members.
- presence of the same number of electron shells in the respective atoms.
- 12. The atomic numbers of elements X and Y are 20 and 17 respectively. Which of the follows compounds is likely to be formed by the combination of the two elements?

An element X has electronic configuration, by 2s 2pt 3s 3pt 4s

To which group of the periodic and does & belong?

- A. XY
- B. XY₂
- C. XY3
- D. X₂Y
- 13. What type of bond will be formed between elements P and Q if their electronegativity values 0.8 and 4.0 respectively?
 - A. Covalent bond
 - Which of the following sets of elements is arranged in order of meres bond standard of the following sets of elements is arranged in order of the following sets of elements is a real set of the following sets of elements is a real set of the following sets of elements is a real set of the following sets of elements is a real set of the following sets of elements is a real set of the following sets of elements is a real set of the following sets of elements is a real set of the following sets of elements is a real set of the following sets of elements is a real set of the following sets of elements is a real set of the following sets of elements is a real set of the following set of the followi
 - C. Ionic bond
 - D. Metallic bond
 - 14. What type of chemical bonding is involved in the formation of NH₄⁺ from a molecule of ammo
 - A. Covalent bonding
 - B. Co-ordinate covalent bonding
 - C. Electrovalent bonding
 - D. Hydrogen bonding
 - 15. What is responsible for metallic bonding?
 - A. Attraction between the delocalized electrons and fixed positive lattice points (cations)
 - B. Attraction between positive and negative ions
 - C. Sharing of electrons between the metal atoms
 - D. Transfer of electrons from one atom to another and a consider that

Use the following portion of the period table to answer Questions 16 to 18.

| | <u> </u> | 11 | III | 1٧ | ٧ | VI | VII | VIII |
|------|----------|------|-------|----|-------|---------|-------|------|
| 1 | A | 01/4 | earth | | | | | В |
| 7 K. | | C | | D | | ~ \ N = | 18, 2 | (5) |
| 7 | E | 8 :- | | | . (~ | | F | G |

- 16. Which of the letters indicate elements which exist as diatomic gases?
 - A. B and G
 - B. C and F
 - C. C and A
 - D. A and E

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| Argon Argon Chlomac Ch | 17. Wh | ich of the letters represents an a | Ikaline earth metal? Him are your animoliol of lo | daidW, |
|---|---------------------|--|--|-------------------|
| B. E. C. D D. C 18. Which of the following pairs of letters denotes elements containing the same number of ele in their outermost shells? A. C and D B. E and F C. B and G D. A and B. 19. If 1 mole of sodium contains 6 × 10 ²³ atoms, how many atoms are contained in 0.6 g of so [Na = 23] A. 1.56 × 10 ²³ B. 1.56 × 10 ²² C. 3.6 × 10 ²² C. 3.6 × 10 ²² D. 3.6 × 10 ²² 20. If 20 cm³ of distilled water is added to 80 cm³ of 0.50 mol dm⁻³ hydrochloric acid, the concentration of the acid will be A. 0.10 mol dm⁻³. B. 0.20 mol dm⁻³. C. 0.40 mol dm⁻³. D. 2.00 mol dm⁻³. 21. Consider the reaction represented by the equation: 2NaHCO _{3(s)} heat Na ₂ CO _{3(s)} + CO _{2(g)} + H ₂ O _(g) . What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO ₃ is he [Molar volume = 22.4 dm³ at s.t.p.] A. 1.12 dm³ B. 2.24 dm³ C. 5.6 dm³ | ALL CHARLES AND AND | | | |
| C. D D. C 18. Which of the following pairs of letters denotes elements containing the same number of ele in their outermost shells? A. C and D B. E and F C. B and G D. A and B 19. If 1 mole of sodium contains 6 × 10 ²³ atoms, how many atoms are contained in 0.6 g of so [Na = 23] A. 1.56 × 10 ²³ B. 1.56 × 10 ²² C. 3.6 × 10 ²³ D. 3.6 × 10 ²² 20. If 20 cm³ of distilled water is added to 80 cm³ of 0.50 mol dm⁻³ hydrochloric acid, the concentration of the acid will be A. 0.10 mol dm⁻³. C. 0.40 mol dm⁻³. D. 2.00 mol dm⁻³. 21. Consider the reaction represented by the equation: 2NaHCO³(s) heat / Na2CO³(s) + CO²(s) + H²O²(s). What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO₃ is he [Molar volume = 22.4 dm³ at s.t.p.] A. 1.12 dm³ B. 2.24 dm³ C. 5.6 dm³ | | | | |
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| 18. Which of the following pairs of letters denotes elements containing the same number of ele in their outermost shells? A. C and D B. E and F C. B and G D. A and B 19. If 1 mole of sodium contains 6 × 10²³ atoms, how many atoms are contained in 0.6 g of so [Na = 23] A. 1.56 × 10²³ B. 1.56 × 10²² C. 3.6 × 10²³ D. 3.6 × 10²² 20. If 20 cm³ of distilled water is added to 80 cm³ of 0.50 mol dm⁻³ hydrochloric acid, the concentration of the acid will be A. 0.10 mol dm⁻³. B. 0.20 mol dm⁻³. C. 0.40 mol dm⁻³. D. 2.00 mol dm⁻³. | D. | C castrement of heat of pent | | |
| B. E and F C. B and G D. A and B 19. If 1 mole of sodium contains 6×10^{23} atoms, how many atoms are contained in 0.6 g of so [Na = 23] A. 1.56×10^{23} B. 1.56×10^{23} B. 1.56×10^{22} C. 3.6×10^{23} D. 3.6×10^{22} 20. If 20 cm^3 of distilled water is added to 80 cm^3 of $0.50 \text{ mol } dm^{-3}$ hydrochloric acid, the concentration of the acid will be A. $0.10 \text{ mol } dm^{-3}$. B. $0.20 \text{ mol } dm^{-3}$. C. $0.40 \text{ mol } dm^{-3}$. D. $2.00 \text{ mol } dm^{-3}$. 21. Consider the reaction represented by the equation: $2\text{NaHCO}_{3(s)} \xrightarrow{\text{heat}} \text{Na}_{2}\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_{2}\text{O}_{(g)}$ What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO ₃ is he [Molar volume = 22.4 dm^3 B. 2.24 dm^3 B. 2.24 dm^3 C. 5.6 dm^3 | 18. Wh | their outermost shells? | ers denotes elements containing the same number | ofelec |
| C. B and G D. A and B 19. If 1 mole of sodium contains 6×10^{23} atoms, how many atoms are contained in $0.6 g$ of so [Na = 23] A. 1.56×10^{23} B. 1.56×10^{22} C. 3.6×10^{23} D. 3.6×10^{22} 20. If 20 cm^3 of distilled water is added to 80 cm^3 of 0.50 mol dm^{-3} hydrochloric acid, the concentration of the acid will be A. 0.10 mol dm^{-3} . B. 0.20 mol dm^{-3} . C. 0.40 mol dm^{-3} . D. 2.00 mol dm^{-3} . 21. Consider the reaction represented by the equation: $2\text{NaHCO}_{3(s)} \xrightarrow{\text{heat}} \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}.$ What volume of carbon (IV) oxide at s.t.p. is evolved when $0.5 \text{ moles of NaHCO}_3$ is he [Molar volume = 22.4 dm^3 at s.t.p.] A. 1.12 dm^3 B. 2.24 dm^3 C. 5.6 dm^3 | . A. | C and D | CH3 CH and Ve CH1 (pp) HO + (pr) | Fi · |
| C. B and G D. A and B 19. If 1 mole of sodium contains 6×10^{23} atoms, how many atoms are contained in $0.6 g$ of so [Na = 23] A. 1.56×10^{23} B. 1.56×10^{22} C. 3.6×10^{23} D. 3.6×10^{22} 20. If 20 cm^3 of distilled water is added to 80 cm^3 of 0.50 mol dm^{-3} hydrochloric acid, the concentration of the acid will be A. 0.10 mol dm^{-3} . B. 0.20 mol dm^{-3} . C. 0.40 mol dm^{-3} . D. 2.00 mol dm^{-3} . 21. Consider the reaction represented by the equation: $2\text{NaHCO}_{3(s)} \xrightarrow{\text{heat}} \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}.$ What volume of carbon (IV) oxide at s.t.p. is evolved when $0.5 \text{ moles of NaHCO}_3$ is he [Molar volume = 22.4 dm^3 at s.t.p.] A. 1.12 dm^3 B. 2.24 dm^3 C. 5.6 dm^3 | В. | | argy change taking place in the reaction show it | no silf |
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| [Na = 23] A. 1.56×10^{23} B. 1.56×10^{22} C. 3.6×10^{23} D. 3.6×10^{22} 20. If 20 cm^3 of distilled water is added to 80 cm^3 of $0.50 \text{ mol } dm^{-3}$ hydrochloric acid, the concentration of the acid will be A. $0.10 \text{ mol } dm^{-3}$. B. $0.20 \text{ mol } dm^{-3}$. C. $0.40 \text{ mol } dm^{-3}$. D. $2.00 \text{ mol } dm^{-3}$. 21. Consider the reaction represented by the equation: $2\text{NaHCO}_{3(s)}^{3} \xrightarrow{\text{heat}} \text{Na}_2 \text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2 \text{O}_{(g)}.$ What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO ₃ is hear [Molar volume = 22.4 dm^3 at s.t.p.] A. 1.12 dm^3 B. 2.24 dm^3 C. 5.6 dm^3 | D. | A and B | dration | B. hy |
| A. 1.56×10^{23} B. 1.56×10^{22} C. 3.6×10^{23} D. 3.6×10^{22} 20. If 20 cm^3 of distilled water is added to 20 cm^3 of 20 cm^3 hydrochloric acid, the concentration of the acid will be A. $0.10 \text{ mol } dm^{-3}$. B. $0.20 \text{ mol } dm^{-3}$. C. $0.40 \text{ mol } dm^{-3}$. D. $2.00 \text{ mol } dm^{-3}$. 21. Consider the reaction represented by the equation: $2 \text{NaHCO}_{3(s)} \xrightarrow{\text{heat}} \text{Na}_2 \text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2 \text{O}_{(g)}.$ What volume of carbon (IV) oxide at s.t.p. is evolved when 20 cm^2 is he [Molar volume = 22.4 dm^3 at s.t.p.] A. 1.12 dm^3 B. 2.24 dm^3 C. 5.6 dm^3 | | | the state of the same of the s | itilizta |
| C. 3.6×10^{23} D. 3.6×10^{22} 20. If 20 cm^3 of distilled water is added to 80 cm^3 of $0.50 \text{ mol } dm^{-3}$ hydrochloric acid, the concentration of the acid will be A. $0.10 \text{ mol } dm^{-3}$. B. $0.20 \text{ mol } dm^{-3}$. C. $0.40 \text{ mol } dm^{-3}$. D. $2.00 \text{ mol } dm^{-3}$. 21. Consider the reaction represented by the equation: $2\text{NaHCO}_{3(s)} \xrightarrow{\text{heat}} \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}.$ What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO ₃ is here. [Molar volume = 22.4 dm^3 at s.t.p.] A. 1.12 dm^3 B. 2.24 dm^3 C. 5.6 dm^3 | Α. | 1.56×10^{23} | of the following processes is an enauthermic/res | doidW |
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| D. 3.6 × 10²² 20. If 20 cm³ of distilled water is added to 80 cm³ of 0.50 mol dm⁻³ hydrochloric acid, the concentration of the acid will be A. 0.10 mol dm⁻³. B. 0.20 mol dm⁻³. C. 0.40 mol dm⁻³. D. 2.00 mol dm⁻³. 21. Consider the reaction represented by the equation: 2NaHCO₃(s) heat → Na₂CO₃(s) + CO₂(g) + H₂O(g). What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO₃ is heat [Molar volume = 22.4 dm³ at s.t.p.] A. 1.12 dm³ B. 2.24 dm³ C. 5.6 dm³ | | | | |
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| C. $0.40 \text{ mol } dm^{-3}$. D. $2.00 \text{ mol } dm^{-3}$. 21. Consider the reaction represented by the equation: $2\text{NaHCO}_{3(s)} \xrightarrow{\text{heat}} \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}.$ What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO ₃ is he [Molar volume = 22.4 dm^3 at s.t.p.] A. 1.12 dm^3 B. 2.24 dm^3 C. 5.6 dm^3 | A | $0.10 \ mol \ dm^{-3}$ | on of KNO & 2712 cm avaporated to dry LYD | iga3 ₁ |
| C. $0.40 \text{ mol } dm^{-3}$. D. $2.00 \text{ mol } dm^{-3}$. 21. Consider the reaction represented by the equation: $2\text{NaHCO}_{3(s)} \xrightarrow{\text{heat}} \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}.$ What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO ₃ is he [Molar volume = 22.4 dm^3 at s.t.p.] A. 1.12 dm^3 B. 2.24 dm^3 C. 5.6 dm^3 | В | $0.20 \ mol \ dm^{-3}$. | FA-14-16-1-3.6 | |
| 21. Consider the reaction represented by the equation: $2\text{NaHCO}_{3(s)} \xrightarrow{\text{heat}} \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}.$ What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO ₃ is held [Molar volume = 22.4 dm^3 at s.t.p.] A. 1.12 dm^3 B. 2.24 dm^3 C. 5.6 dm^3 | C | | | |
| 21. Consider the reaction represented by the equation: $2\text{NaHCO}_{3(s)} \xrightarrow{\text{heat}} \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}.$ What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO ₃ is he [Molar volume = 22.4 dm ³ at s.t.p.] A. 1.12 dm ³ B. 2.24 dm ³ C. 5.6 dm ³ | 140 | | autors: / X | |
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| What volume of carbon (IV) oxide at s.t.p. is evolved when 0.5 moles of NaHCO ₃ is he [Molar volume = $22.4 \ dm^3$ at s.t.p.] A. $1.12 \ dm^3$ B. $2.24 \ dm^3$ C. $5.6 \ dm^3$ | 21. C | consider the reaction represented | by the equation: | |
| [Molar volume = $22.4 \ dm^3$ at s.t.p.] A. $1.12 \ dm^3$ B. $2.24 \ dm^3$ C. $5.6 \ dm^3$ | | | | У |
| Molar volume = 22.4 dm^3 at s.t.p.] A. 1.12 dm^3 sould of anothic sensor anothic success growell of odd d and d | V | What volume of carbon (IV) oxid | | 3 is hea |
| B. 2.24 dm ³ C. 5.6 dm ³ | | [Molar volume = 22.4 dm^3 | at s.t.p.] | d i |
| B. 2.24 dm ³ C. 5.6 dm ³ | | $1.12 dm^3$ | if the following agreeing solutions turns and little | Visien o |
| C. $5.6 dm^3$ | | 2011 | 0 | Nai |
| Political Control of the Control of | | 2 | 28+1:120 | HO |
| | | | 10 | MA |

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6

22. Which of the following gases will have the lowest rate of diffusion under the same condition

[N = 14, O = 16, Cl = 35.5, Ar = 40.]

- A. Argon
- B. Chlorine
- C. Nitrogen
- D. Oxygen

23. Consider the reaction:

$$H_{(aq)}^+ + OH_{(aq)}^- \longrightarrow H_2O_{(l)}$$
.

The energy change taking place in the reaction above is enthalpy of

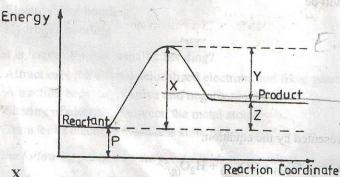
- A. formation.
- B. hydration.
- C. neutralization.
- D. solution.

24. Which of the following processes is an endothermic reaction?

- A. Dissolving NH₄Cl crystals in water
- B. Addition of concentrated H₂SO₄ to water
- C. Dissolving NaOH pellets in water
- D. Passing SO₃ gas into water

25. In the energy profile diagram below, which letter represents the activation energy for the reverence reaction?

What volume of carbon (IV) oxide at sith is crowed



- A. X
- B. Y
 - C. Z
 - D. P

26. Which of the following aqueous solutions turns red litmus to blue?

- A. NaCl
- B. CH₃COONa
- C. AlCl₃
- D. NH₄Cl

2028

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- 27. Which of the following methods cannot be used to distinguish between a strong acid and a weak acid?
 - A. Conductivity measurement
 - B. Measurement of pH
 - C. Measurement of heat of neutralization
 - D. Action on starch iodide paper
- 28. The indicator used in neutralizing CH₃COOH and NaOH solutions has a pH range of
 - A. 3-5.
 - B. 7 8.
 - C. 8 10.
 - D. 10 12.
- 29. When aqueous ammonia is added to one of the following solutions, a white precipitate which dissolves in excess ammonia is formed. Identify the solution.
 - A. ZnCl_{2(aq)}
 - B. $Pb(NO_3)_{2(aq)}$
 - C. CuSO_{4(aq)}
 - D. FeSO_{4(aq)}
- 30. When 50 cm³ of a saturated solution of KNO₃ at 25°C was evaporated to dryness, 10 g of dry salt was obtained. What is the solubility of KNO₃ at 25°C?

$$[KNO_3 = 101]$$

- A. 0.10 mol dm^{-3}
- B. 2.0 mol dm^{-3}
- C. 5.0 mol dm^{-3}
- D. 10.0 mol dm^{-3}
- 31. Which of the following compounds absorbs moisture from the atmosphere and dissolves in it?

Which of the following conditions will not increase the

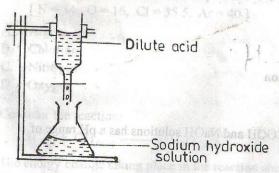
Decrease in temperature

- A. FeCl3 Del quescent
- B. MgSO₄·7H₂O
- C. Na₂SO₄
- D. KCl

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8

32. Consider the diagram below: Sugarable of heart and together assentian



The set-up is used for the preparation of a salt by

- A. double decomposition.
- B. crystallization.
- C. neutralization.
- D. direct combination. Tutos grawolfol art to one of babba si amomma guesupa narlw
- 33. Consider the equation for the equilibrium reaction

$$N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}; \Delta H = -92 \, kJmol^{-1}$$

The equilibrium constant for the reaction can be expressed as

A.
$$K_c = \frac{2[NH_3]}{3[H_2][N_2]}$$
.

B.
$$K_c = \frac{[NH_3]^2}{[N_2][H_2]^3}$$
.

C.
$$K_c = \frac{3[H_2][N_2]}{2[NH_3]}$$
.

D.
$$K_c = \frac{[N_2][H_2]^3}{[NH_3]^2}$$

34. Consider the reaction represented by the equation:

$$2SO_{2(g)} + O_{2(g)} \Longrightarrow 2SO_{3(g)}; \Delta H = -197 \, kJmol^{-1}$$

Which of the following conditions will **not** increase the yield of sulphur (VI) oxide?

- A. Increase in temperature
- B. Decrease in temperature
- C. Increase in pressure
- D. Addition of O₂ into the mixture

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9

| 35. Electrolysis is applied in the following processes exc | 35. | Electro | lysis is | applie | ed in | the | followin | ng pro | cesses | exce | pt |
|--|-----|---------|----------|--------|-------|-----|----------|--------|--------|------|----|
|--|-----|---------|----------|--------|-------|-----|----------|--------|--------|------|----|

- A. electroplating.
- B. extraction of aluminium.
- C. extraction of iron.
- D. purification of copper.

36. The oxidation number of iodine in the iodate ion (IO_3^2) is

- A. -5.
- B. -1.
- C. +1.
- D. +5.

- A. reduction
- B. oxidation.
- C. hydrolysis.
- D. decomposition.

38. Consider the reaction:

$$2Al_{(s)}^+ + 6H_{(aq)}^+ \longrightarrow 2Al_{(aq)}^{3+} + 3H_{2(g)}^-$$
. A special polynomial polynomial of a constant $2Al_{(aq)}^+ + 3H_{2(g)}^-$.

What is the total number of moles of electrons transferred from the aluminium atoms to the hydrogen ions?

- A. 3
- B. 4
- C. 5
- D. 6

39. In the reaction represented by the equation:

$$5Fe_{(aq)}^{2+} + MnO_{4(aq)}^{-} + 8H_{(aq)}^{+} \longrightarrow 5Fe_{(aq)}^{3+} + Mn_{(aq)}^{2+} + 4H_2O_{(l)}^{-}$$

which species is reduced?

- A. Fe²⁺
- B. MnO_4
- C. H⁺
- D. Fe³⁺

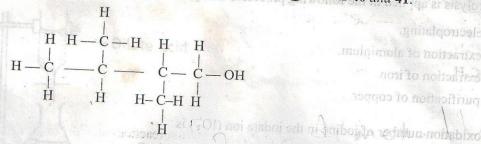
Turn over

Mr +7 to +2 reduced

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10

Use the structure of the compound below to answer Questions 40 and 41.



- 40. The name of the compound is
 - 2, 3-dimethylbutan-1-ol.
 - 2, 3-dimethylbutan-4-ol.
 - C. 2-methylpentan-1-ol.
 - 3-methylpentan-1-ol.
- 41. The product of the complete oxidation of the compound will be an

tion for the combinition reaction

- A. alkane.
- alkanal.
- alkanoic acid.
- alkanone.
- 42. Which of the following industrial processes is chlorine not used?
 - Production of polyvinylchloride (PVC)
 - Manufacturing of hydrochloric acid was also ad selom to reducing the standard and a selom to reducing the standard and selection and selection
 - Manufacturing of common salt
 - Manufacturing of domestic bleach
- 43. What type of reaction occurs between vegetable oil and plant ash extract?
 - A. Displacement
 - B. Dehydration
 - Neutralization
 - Saponification
- 44. Which of the following compounds is an alkanoate?
 - CH3COOH-
 - CH3COOCH3
 - CH₃CH₂OH
 - D. CH₃CH₂COOH

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All questions converged analis.

11

45. What is C_aH_b in the following equation?

$$C_aH_b + 5O_2 \longrightarrow 3CO_2 + 4H_2O$$

- A. C3H4 bund noises more money april : hat genetican make a remain a remain
- B. C3H6 III nonces to H notices rentie mon material en
- Credit will be given for clarity of expression and orderly presentation of months.

46. Which of the following equations represents a substitution reaction?

A.
$$C_4H_{10(g)} + Cl_{2(g)} \longrightarrow C_4H_9Cl_{(g)} + HCl_{(g)}$$

- B. $C_2H_{4(g)} + HCl_{(g)} \longrightarrow C_2H_5Cl_{(l)}$ and the small second seco
- C. $C_2H_{2(g)} + 2H_{2(g)} \longrightarrow C_2H_{6(g)}$ and have a restricted of the Court of
- D. $C_3H_{4(g)} + 4O_{2(g)} \longrightarrow 3CO_{2(g)} + 2H_2O_{(g)}$

47. Greenhouse effect can be reduced by controlling

- Lattle Alpha particle emission by ""U produces an element & B.noitsroquya fatwor, A the
- particle A produces another element B. Elemen lauf lissof bns boow fo gninrud ... B. John
 - C. the use of aerosols. Saranszeries to another beometed entity. SA 222 countries of
 - D. the use of artificial fertilizers.

48. Waste plastics accumulate in the soil and pollute the environment because plastic materials are

- insoluble in water.
- B. non-biodegradable.
- easily affected by heat.
- D. inflammable.

49. Which of the following substances is an ore of iron?

- A. Bauxite Humi
- Baplain why the boiling point of HaS with relative molecular mass of strings and that
 - C. Haematite

50. The ammonium compound used in the manufacture of dry cells is HCL is passed into each

- A. NH₄NO₃.
- B. (NH₄)₂SO₄.
- C. NH₄Cl.

DO NOT TURN UNTIL YOU ARE

ZED SEVERELY IF YOU ARE YOU WILL BE PENAI FOUND LOOKING AT THE NEXT PAGE BEFORE YOU ARE TOLD TO DO SO.