3.6 Chemistry: Acids, Reactions and the Periodic Table: 2-hour Pack

Total Marks

ISEB CE 13+ Science (Chemistry) · Calculator allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Which salt is made when sulfuric acid reacts with copper oxide?

- ☐ A) copper sulfate
- ☐ B) copper chloride
- ☐ C) zinc sulfate
- ☐ D) calcium sulfate
- ☐ E) copper nitrate

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2 Neutralisation reactions between acids and bases produce a salt and water. Name the salt formed in each reaction. dilute nitric acid + potassium hydroxide -> ___ + water

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3 Calculate the relative formula mass of NaCl. (Relative atomic masses: Na = 23, Cl = 35.5.)

- ☐ A) 81.5
- ☐ B) 94
- ☐ C) 58.5
- ☐ D) 35.5
- ☐ E) 585

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4 Which substance has the formula MgO?

- ☐ A) nitric acid
- ☐ B) magnesium oxide
- ☐ C) sodium chloride
- ☐ D) sulfur dioxide
- ☐ E) oxygen gas

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5 Which pH value belongs to a solution that is strongly acidic?

- ☐ A) pH 6
- ☐ B) pH 7
- ☐ C) pH 5
- ☐ D) pH 1
- ☐ E) pH 4

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6 Zinc reacts with hydrochloric acid and aluminium reacts with sulfuric acid. Name the gas produced in both reactions.

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7 Calculate the relative formula mass of NH_3. (Relative atomic masses: H = 1, N = 14.)

- ☐ A) 31
- ☐ B) 18
- ☐ C) 15
- ☐ D) 16
- ☐ E) 17

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8 Which substance has the formula HCl?

- ☐ A) calcium carbonate
- ☐ B) nitric acid
- ☐ C) sodium chloride
- ☐ D) hydrochloric acid
- ☐ E) hydrogen gas

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9 Which salt is made when hydrochloric acid reacts with zinc carbonate?

- ☐ A) zinc nitrate
- ☐ B) zinc chloride
- ☐ C) potassium chloride
- ☐ D) magnesium chloride
- ☐ E) zinc sulfate

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10 Calculate the relative formula mass of $Ca(NO_3)_2$. (Relative atomic masses: N = 14, O = 16, Ca = 40.)

- ☐ A) 150
- ☐ B) 70
- ☐ C) 164
- ☐ D) 178
- ☐ E) 1640

---

11 Which substance has the formula $C_6H_{12}O_6$?

- ☐ A) oxygen gas
- ☐ B) ammonia
- ☐ C) hydrogen gas
- ☐ D) water
- ☐ E) glucose

---

12 Which salt is made when hydrochloric acid reacts with zinc?

- ☐ A) zinc chloride
- ☐ B) zinc nitrate
- ☐ C) copper chloride
- ☐ D) zinc sulfate
- ☐ E) magnesium chloride

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13 Neutralisation reactions between acids and bases produce a salt and water. Hydrochloric acid reacts with calcium hydroxide. Name the salt formed in this reaction.

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14 Argon has an atomic number of 18 and a mass number of 40. State the number of electrons in a neutral atom of argon.

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15 Calculate the relative formula mass of Fe_2O_3. (Relative atomic masses: O = 16, Fe = 56.)

- ☐ A) 160
- ☐ B) 144
- ☐ C) 176
- ☐ D) 72
- ☐ E) 216

---

16 Which substance has the formula CO?

- ☐ A) water
- ☐ B) calcium hydroxide
- ☐ C) nitrogen gas
- ☐ D) carbon dioxide
- ☐ E) carbon monoxide

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17 Which salt is made when sulfuric acid reacts with zinc?

- ☐ A) calcium sulfate
- ☐ B) sodium sulfate
- ☐ C) zinc sulfate
- ☐ D) zinc chloride
- ☐ E) zinc nitrate

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18 Neutralisation reactions between acids and bases produce a salt and water. Nitric acid reacts with iron oxide. Name the salt formed in this reaction.

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19 Calculate the relative formula mass of NO_2. (Relative atomic masses: N = 14, O = 16.)

- ☐ A) 60
- ☐ B) 46
- ☐ C) 62
- ☐ D) 32
- ☐ E) 30

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20 Which substance has the formula NaCl?

- ☐ A) magnesium oxide
- ☐ B) glucose
- ☐ C) ammonia
- ☐ D) sodium chloride
- ☐ E) oxygen gas

---

21 Which salt is made when nitric acid reacts with potassium hydroxide?

- ☐ A) zinc nitrate
- ☐ B) potassium nitrate
- ☐ C) potassium sulfate
- ☐ D) sodium nitrate
- ☐ E) potassium chloride

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22 Complete the word equations for the reactions between each metal and an acid. Iron reacts with sulfuric acid. Write the two products formed.

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23 Calculate the relative formula mass of $Al(OH)_3$. (Relative atomic masses: H = 1, O = 16, Al = 27.)

- ☐ A) 77
- ☐ B) 44
- ☐ C) 79
- ☐ D) 46
- ☐ E) 78

---

24 Calculate the relative formula mass of $MgCl_2$. (Relative atomic masses: Mg = 24, Cl = 35.5.)

- ☐ A) 95
- ☐ B) 71
- ☐ C) 119
- ☐ D) 59.5
- ☐ E) 130.5

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25 Which substance has the formula N_2?

- ☐ A) nitrogen gas
- ☐ B) carbon monoxide
- ☐ C) magnesium oxide
- ☐ D) water
- ☐ E) copper oxide

---

26 Which salt is made when nitric acid reacts with calcium carbonate?

- ☐ A) calcium chloride
- ☐ B) calcium sulfate
- ☐ C) magnesium nitrate
- ☐ D) calcium nitrate
- ☐ E) potassium nitrate

---

27 Complete the word equation for the reaction between each metal and an acid. Copper reacts with dilute sulfuric acid. Write the two products formed, or write no reaction if none occurs.

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28 Calculate the relative formula mass of SO_2. (Relative atomic masses: O = 16, S = 32.)

- ☐ A) 96
- ☐ B) 48
- ☐ C) 64
- ☐ D) 80
- ☐ E) 640

---

29 What is the chemical formula of water?

- ☐ A) H_2SO_4
- ☐ B) NH_3
- ☐ C) H_2O
- ☐ D) NaCl
- ☐ E) CH_4

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30 Which salt is made when hydrochloric acid reacts with copper oxide?

- ☐ A) copper nitrate
- ☐ B) calcium chloride
- ☐ C) copper sulfate
- ☐ D) copper chloride
- ☐ E) sodium chloride

---

31 Complete the word equation for the reaction between each metal and an acid. Zinc reacts with hydrochloric acid. Write the two products formed.

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32 Calculate the relative formula mass of Na_2SO_4. (Relative atomic masses: O = 16, Na = 23, S = 32.)

- ☐ A) 126
- ☐ B) 142
- ☐ C) 158
- ☐ D) 71
- ☐ E) 174

---

33 What is the chemical formula of carbon monoxide?

- ☐ A) CO
- ☐ B) N_2
- ☐ C) SO_2
- ☐ D) MgO
- ☐ E) NaCl

---

34 Which salt is made when hydrochloric acid reacts with iron?

- ☐ A) potassium chloride
- ☐ B) magnesium chloride
- ☐ C) calcium chloride
- ☐ D) zinc chloride
- ☐ E) iron(II) chloride

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35 Which of these solutions is NOT an alkali?

- ☐ A) oven cleaner
- ☐ B) limewater
- ☐ C) bleach
- ☐ D) potassium hydroxide solution
- ☐ E) nitric acid

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36 Sodium has an atomic number of 11 and a mass number of 23. How many neutrons are in one atom of sodium?

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37 Calculate the relative formula mass of KOH. (Relative atomic masses: H = 1, O = 16, K = 39.)

- ☐ A) 95
- ☐ B) 57
- ☐ C) 55
- ☐ D) 560
- ☐ E) 56

---

38 What is the chemical formula of sulfuric acid?

- ☐ A) $Ca(OH)_2$
- ☐ B) CH_4
- ☐ C) H_2SO_4
- ☐ D) HNO_3
- ☐ E) N_2

---

39 Which salt is made when nitric acid reacts with calcium hydroxide?

- ☐ A) calcium chloride
- ☐ B) calcium nitrate
- ☐ C) calcium sulfate
- ☐ D) copper nitrate
- ☐ E) magnesium nitrate

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40 Calculate the relative formula mass of Al_2O_3. (Relative atomic masses: O = 16, Al = 27.)

- ☐ A) 43
- ☐ B) 118
- ☐ C) 129
- ☐ D) 102
- ☐ E) 86

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41 What is the chemical formula of calcium hydroxide?

- ☐ A) $Ca(OH)_2$
- ☐ B) CO
- ☐ C) H_2O_2
- ☐ D) MgO
- ☐ E) $CaCO_3$

---

42 Which salt is made when nitric acid reacts with zinc oxide?

- ☐ A) potassium nitrate
- ☐ B) zinc chloride
- ☐ C) magnesium nitrate
- ☐ D) zinc nitrate
- ☐ E) zinc sulfate

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43 The pH scale is used to measure how acidic or alkaline a solution is. A solution with pH 3 is ___

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44 Calculate the relative formula mass of CO_2. (Relative atomic masses: C = 12, O = 16.)

- ☐ A) 32
- ☐ B) 56
- ☐ C) 60
- ☐ D) 28
- ☐ E) 44

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45 What is the chemical formula of sodium chloride?

- ☐ A) $C_6H_{12}O_6$
- ☐ B) $CaCO_3$
- ☐ C) CuO
- ☐ D) NaCl
- ☐ E) NaOH

---

46 What is the chemical formula of sodium hydroxide?

- ☐ A) CuO
- ☐ B) CO
- ☐ C) NaOH
- ☐ D) CH_4
- ☐ E) NaCl

---

47 Which salt is made when hydrochloric acid reacts with potassium hydroxide?

- ☐ A) potassium chloride
- ☐ B) potassium nitrate
- ☐ C) calcium chloride
- ☐ D) potassium sulfate
- ☐ E) magnesium chloride

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48 A student measures the temperature rise when magnesium reacts with dilute hydrochloric acid. She repeats the experiment three times, recording 12.0 C, 12.5 C and 18.0 C. Identify the anomalous result.

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49 What is the chemical formula of oxygen gas?

- ☐ A) HNO_3
- ☐ B) O_2
- ☐ C) NaOH
- ☐ D) CH_4
- ☐ E) H_2O

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50 Which salt is made when sulfuric acid reacts with potassium hydroxide?

- ☐ A) potassium chloride
- ☐ B) magnesium sulfate
- ☐ C) sodium sulfate
- ☐ D) potassium sulfate
- ☐ E) potassium nitrate

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51 Phosphorus has an atomic number of 15 and a mass number of 31. Calculate the number of neutrons in an atom of phosphorus.

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52 What is the chemical formula of methane?

- ☐ A) CH_4
- ☐ B) N_2
- ☐ C) MgO
- ☐ D) H_2O
- ☐ E) CO_2

---

53 Which salt is made when hydrochloric acid reacts with calcium hydroxide?

- ☐ A) calcium nitrate
- ☐ B) zinc chloride
- ☐ C) calcium chloride
- ☐ D) sodium chloride
- ☐ E) calcium sulfate

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54 Fluorine has an atomic number of 9 and a mass number of 19. State the number of protons in an atom of fluorine.

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55 What is the chemical formula of hydrogen gas?

- ☐ A) $C_6H_{12}O_6$
- ☐ B) H_2
- ☐ C) O_2
- ☐ D) NH_3
- ☐ E) CO_2

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56 Which gas gives this result: damp litmus paper is bleached white?

- ☐ A) carbon dioxide
- ☐ B) ammonia
- ☐ C) chlorine
- ☐ D) oxygen
- ☐ E) hydrogen

---

57 Which salt is made when nitric acid reacts with copper oxide?

- ☐ A) magnesium nitrate
- ☐ B) copper chloride
- ☐ C) calcium nitrate
- ☐ D) copper sulfate
- ☐ E) copper nitrate

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58 Potassium has an atomic number of 19 and a mass number of 39. State the number of electrons in a neutral atom of potassium.

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59 What is the chemical formula of glucose?

- ☐ A) CO
- ☐ B) $C_6H_{12}O_6$
- ☐ C) SO_2
- ☐ D) CH_4
- ☐ E) $CaCO_3$

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60 Which salt is made when hydrochloric acid reacts with calcium carbonate?

- ☐ A) copper chloride
- ☐ B) calcium nitrate
- ☐ C) calcium chloride
- ☐ D) zinc chloride
- ☐ E) calcium sulfate

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61 Complete the word equations for the reactions between each metal and an acid. Aluminium reacts with sulfuric acid. Write the two products formed.

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62 What colour does red litmus paper turn in an alkali?

- ☐ A) colourless
- ☐ B) blue
- ☐ C) green
- ☐ D) yellow
- ☐ E) pink

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63 Which pH value belongs to a solution that is weakly acidic?

- ☐ A) pH 10
- ☐ B) pH 5
- ☐ C) pH 7
- ☐ D) pH 14
- ☐ E) pH 2

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64 Hydrochloric acid reacts with sodium hydroxide to make a salt and which other product(s)?

- ☐ A) carbon dioxide only
- ☐ B) oxygen
- ☐ C) water
- ☐ D) water and carbon dioxide
- ☐ E) hydrogen

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65 A student measures the time taken for zinc powder to fully dissolve when excess powder is added to dilute sulfuric acid. She repeats the experiment three times, recording 55 s, 82 s and 57 s. Identify the anomalous result.

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66 Calculate the relative formula mass of HCl. (Relative atomic masses: H = 1, Cl = 35.5.)

- ☐ A) 36.5
- ☐ B) 365
- ☐ C) 72
- ☐ D) 35.5
- ☐ E) 37.5

---

67 Which of these solutions is NOT an alkali?

- ☐ A) limewater
- ☐ B) oven cleaner
- ☐ C) bleach
- ☐ D) sodium chloride solution
- ☐ E) sodium hydroxide solution

---

68 What is the chemical formula of ammonia?

- ☐ A) CO
- ☐ B) H_2
- ☐ C) N_2
- ☐ D) HCl
- ☐ E) NH_3

---

69 Which gas gives this result: a glowing splint relights?

- ☐ A) ammonia
- ☐ B) hydrogen
- ☐ C) carbon dioxide
- ☐ D) chlorine
- ☐ E) oxygen

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70 Which pH value belongs to a solution that is weakly alkaline?

- ☐ A) pH 8
- ☐ B) pH 5
- ☐ C) pH 7
- ☐ D) pH 1
- ☐ E) pH 13

---

71 Hydrochloric acid reacts with potassium hydroxide to make a salt and which other product(s)?

- ☐ A) oxygen
- ☐ B) water
- ☐ C) water and carbon dioxide
- ☐ D) carbon dioxide only
- ☐ E) hydrogen

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72 Neon has an atomic number of 10 and a mass number of 20. State the number of electrons in a neutral atom of neon.

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73 Calculate the relative formula mass of H_2SO_4. (Relative atomic masses: H = 1, O = 16, S = 32.)

- ☐ A) 97
- ☐ B) 99
- ☐ C) 98
- ☐ D) 130
- ☐ E) 49

---

74 Which of these solutions is NOT an acid?

- ☐ A) sulfuric acid
- ☐ B) lemon juice
- ☐ C) sodium hydroxide solution
- ☐ D) hydrochloric acid
- ☐ E) nitric acid

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75 Which substance has the formula O_2?

- ☐ A) copper oxide
- ☐ B) oxygen gas
- ☐ C) water
- ☐ D) hydrogen peroxide
- ☐ E) nitrogen gas

---

76 What is the test result for oxygen gas?

- ☐ A) a lit splint makes a squeaky pop
- ☐ B) damp red litmus paper turns blue
- ☐ C) limewater turns cloudy (milky)
- ☐ D) damp litmus paper is bleached white
- ☐ E) a glowing splint relights

---

77 What colour does blue litmus paper turn in an acid?

- ☐ A) yellow
- ☐ B) pink
- ☐ C) green
- ☐ D) red
- ☐ E) orange

---

78 A solution has pH 14. How would it be described?

- ☐ A) strongly alkaline
- ☐ B) neutral
- ☐ C) weakly alkaline
- ☐ D) strongly acidic
- ☐ E) weakly acidic

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79 Which salt is made when nitric acid reacts with magnesium carbonate?

- ☐ A) magnesium nitrate
- ☐ B) calcium nitrate
- ☐ C) potassium nitrate
- ☐ D) magnesium chloride
- ☐ E) magnesium sulfate

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80 Sulfur has an atomic number of 16 and a mass number of 32. State the number of protons in an atom of sulfur.

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81 Calculate the relative formula mass of KNO_3. (Relative atomic masses: N = 14, O = 16, K = 39.)

- ☐ A) 87
- ☐ B) 115
- ☐ C) 101
- ☐ D) 69
- ☐ E) 140

---

82 Which of these solutions is NOT an acid?

- ☐ A) nitric acid
- ☐ B) hydrochloric acid
- ☐ C) vinegar
- ☐ D) oven cleaner
- ☐ E) sulfuric acid

---

83 What is the chemical formula of calcium carbonate?

- ☐ A) H_2O_2
- ☐ B) $CaCO_3$
- ☐ C) N_2
- ☐ D) H_2SO_4
- ☐ E) H_2

---

84 Which gas gives this result: limewater turns cloudy (milky)?

- ☐ A) chlorine
- ☐ B) hydrogen
- ☐ C) oxygen
- ☐ D) ammonia
- ☐ E) carbon dioxide

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85 What colour is universal indicator in a strong acid (pH 1)?

- [ ] A) purple
- [ ] B) blue
- [ ] C) green
- [ ] D) colourless
- [ ] E) red

---

86 Which pH value belongs to a solution that is weakly acidic?

- [ ] A) pH 7
- [ ] B) pH 10
- [ ] C) pH 9
- [ ] D) pH 4
- [ ] E) pH 1

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87 Hydrochloric acid reacts with magnesium to make a salt and which other product(s)?

- [ ] A) water and carbon dioxide
- [ ] B) hydrogen
- [ ] C) water
- [ ] D) carbon dioxide only
- [ ] E) oxygen

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88 Neutralisation reactions between acids and bases produce a salt and water. Hydrochloric acid reacts with zinc oxide. Name the salt formed in this reaction.

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89 Calculate the relative formula mass of CaO. (Relative atomic masses: O = 16, Ca = 40.)

- [ ] A) 56
- [ ] B) 560
- [ ] C) 72
- [ ] D) 40
- [ ] E) 96

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90 Which of these solutions is NOT an alkali?

- [ ] A) oven cleaner
- [ ] B) sodium hydroxide solution
- [ ] C) vinegar
- [ ] D) bleach
- [ ] E) potassium hydroxide solution

---

91 What is the chemical formula of hydrochloric acid?

- [ ] A) HCl
- [ ] B) O_2
- [ ] C) MgO
- [ ] D) N_2
- [ ] E) $C_6H_{12}O_6$

---

92 Which gas gives this result: damp red litmus paper turns blue?

- [ ] A) chlorine
- [ ] B) ammonia
- [ ] C) carbon dioxide
- [ ] D) hydrogen
- [ ] E) oxygen

---

93 What colour is litmus solution in a neutral solution?

- [ ] A) green
- [ ] B) blue
- [ ] C) pink
- [ ] D) orange
- [ ] E) purple

---

94 A solution has pH 9. How would it be described?

- [ ] A) neutral
- [ ] B) strongly acidic
- [ ] C) weakly alkaline
- [ ] D) weakly acidic
- [ ] E) strongly alkaline

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95 Which salt is made when sulfuric acid reacts with magnesium carbonate?

- ☐ A) magnesium chloride
- ☐ B) magnesium nitrate
- ☐ C) potassium sulfate
- ☐ D) magnesium sulfate
- ☐ E) copper sulfate

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96 Neutralisation reactions between acids and bases produce a salt and water. Sulfuric acid reacts with magnesium oxide. Name the salt formed in this reaction.

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97 Calculate the relative formula mass of CH_4. (Relative atomic masses: H = 1, C = 12.)

- ☐ A) 15
- ☐ B) 13
- ☐ C) 16
- ☐ D) 17
- ☐ E) 28

---

98 What is the chemical formula of nitrogen gas?

- ☐ A) CH_4
- ☐ B) NaCl
- ☐ C) HNO_3
- ☐ D) H_2O
- ☐ E) N_2

---

99 Which gas gives this result: a lit splint makes a squeaky pop?

- ☐ A) hydrogen
- ☐ B) carbon dioxide
- ☐ C) ammonia
- ☐ D) oxygen
- ☐ E) chlorine

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100 What colour is universal indicator in a strong alkali (pH 14)?

- ☐ A) yellow
- ☐ B) purple
- ☐ C) colourless
- ☐ D) blue
- ☐ E) pink

---

101 Which pH value belongs to a solution that is strongly alkaline?

- ☐ A) pH 10
- ☐ B) pH 1
- ☐ C) pH 6
- ☐ D) pH 7
- ☐ E) pH 14

---

102 Hydrochloric acid reacts with zinc to make a salt and which other product(s)?

- ☐ A) oxygen
- ☐ B) water and carbon dioxide
- ☐ C) hydrogen
- ☐ D) chlorine
- ☐ E) water

---

103 Hydrogen has an atomic number of 1 and a mass number of 1. State the number of protons in an atom of hydrogen.

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104 Calculate the relative formula mass of Na_2CO_3. (Relative atomic masses: C = 12, O = 16, Na = 23.)

- ☐ A) 106
- ☐ B) 51
- ☐ C) 129
- ☐ D) 94
- ☐ E) 118

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105 Which of these solutions is NOT an acid?

- ☐ A) lemon juice
- ☐ B) sugar solution
- ☐ C) sulfuric acid
- ☐ D) citric acid
- ☐ E) vinegar

---

106 What is the chemical formula of sulfur dioxide?

- ☐ A) H_2SO_4
- ☐ B) $Ca(OH)_2$
- ☐ C) NH_3
- ☐ D) SO_2
- ☐ E) CH_4

---

107 What is the test result for chlorine gas?

- ☐ A) limewater turns cloudy (milky)
- ☐ B) a glowing splint relights
- ☐ C) a lit splint makes a squeaky pop
- ☐ D) damp litmus paper is bleached white
- ☐ E) damp red litmus paper turns blue

---

108 What colour is universal indicator in a weak alkali of about pH 10?

- ☐ A) pink
- ☐ B) blue
- ☐ C) orange
- ☐ D) yellow
- ☐ E) red

---

109 A solution has pH 10. How would it be described?

- ☐ A) strongly alkaline
- ☐ B) strongly acidic
- ☐ C) weakly alkaline
- ☐ D) neutral
- ☐ E) weakly acidic

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110 Which salt is made when sulfuric acid reacts with magnesium?

- ☐ A) calcium sulfate
- ☐ B) copper sulfate
- ☐ C) magnesium chloride
- ☐ D) magnesium nitrate
- ☐ E) magnesium sulfate

---

111 Complete the word equations for the reactions between each metal and an acid. Zinc reacts with sulfuric acid. Write the two products formed.

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112 Calculate the relative formula mass of $MgCO_3$. (Relative atomic masses: C = 12, O = 16, Mg = 24.)

- ☐ A) 84
- ☐ B) 52
- ☐ C) 108
- ☐ D) 96
- ☐ E) 72

---

113 Which of these solutions is NOT an acid?

- ☐ A) lemon juice
- ☐ B) citric acid
- ☐ C) sulfuric acid
- ☐ D) pure water
- ☐ E) hydrochloric acid

---

114 What is the chemical formula of magnesium oxide?

- ☐ A) NaOH
- ☐ B) MgO
- ☐ C) O_2
- ☐ D) SO_2
- ☐ E) CuO

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115 What is the test result for hydrogen gas?

- ☐ A) a lit splint makes a squeaky pop
- ☐ B) a glowing splint relights
- ☐ C) damp litmus paper is bleached white
- ☐ D) damp red litmus paper turns blue
- ☐ E) limewater turns cloudy (milky)

---

116 What colour is blue litmus paper after it is dipped in an alkali?

- ☐ A) purple
- ☐ B) red
- ☐ C) blue
- ☐ D) yellow
- ☐ E) pink

---

117 A solution has pH 2. How would it be described?

- ☐ A) neutral
- ☐ B) strongly alkaline
- ☐ C) weakly alkaline
- ☐ D) weakly acidic
- ☐ E) strongly acidic

---

118 Which salt is made when hydrochloric acid reacts with sodium carbonate?

- ☐ A) sodium sulfate
- ☐ B) sodium nitrate
- ☐ C) sodium chloride
- ☐ D) potassium chloride
- ☐ E) calcium chloride

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119 Complete the word equations for the reactions between each metal and an acid. Copper reacts with sulfuric acid. Write the products formed, or write no reaction if none occurs.

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(1)

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120 Calculate the percentage by mass of Mg in MgO. (Relative atomic masses: O = 16, Mg = 24.)

- ☐ A) 24%
- ☐ B) 60%
- ☐ C) 40%
- ☐ D) 6%
- ☐ E) 600%

---

121 Which of these solutions is an acid?

- ☐ A) sodium hydroxide solution
- ☐ B) pure water
- ☐ C) ammonia solution
- ☐ D) nitric acid
- ☐ E) potassium hydroxide solution

---

122 Which substance has the formula H_2O_2?

- ☐ A) copper oxide
- ☐ B) nitrogen gas
- ☐ C) carbon monoxide
- ☐ D) methane
- ☐ E) hydrogen peroxide

---

123 What is the test result for ammonia gas?

- ☐ A) damp red litmus paper turns blue
- ☐ B) a lit splint makes a squeaky pop
- ☐ C) limewater turns cloudy (milky)
- ☐ D) damp litmus paper is bleached white
- ☐ E) a glowing splint relights

---

124 What colour is phenolphthalein in an acid?

- ☐ A) green
- ☐ B) pink
- ☐ C) yellow
- ☐ D) colourless
- ☐ E) orange

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125 A solution has pH 8. How would it be described?

- ☐ A) strongly acidic
- ☐ B) weakly alkaline
- ☐ C) weakly acidic
- ☐ D) neutral
- ☐ E) strongly alkaline

---

126 Which salt is made when nitric acid reacts with sodium hydroxide?

- ☐ A) magnesium nitrate
- ☐ B) sodium chloride
- ☐ C) sodium nitrate
- ☐ D) sodium sulfate
- ☐ E) potassium nitrate

---

127 Oxygen has an atomic number of 8 and a mass number of 16. State the number of protons in an atom of oxygen.

(1)

---

128 Calculate the relative formula mass of $Mg(OH)_2$. (Relative atomic masses: H = 1, O = 16, Mg = 24.)

- ☐ A) 58
- ☐ B) 59
- ☐ C) 41
- ☐ D) 57
- ☐ E) 42

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Mark scheme · 3.6 Chemistry: Acids, Reactions and the Periodic Table: 2-hour Pack

Question 1

A (copper sulfate) **B1**

Answer: A) copper sulfate

Question 2

Potassium nitrate (oe) **B1**

Answer: Potassium nitrate

Question 3

C (58.5) **B1**

Answer: C) 58.5

Question 4

B (magnesium oxide) **B1**

Answer: B) magnesium oxide

Question 5

D (pH 1) **B1**

Answer: D) pH 1

Question 6

Hydrogen (oe) **B1**

Answer: Hydrogen

Question 7

E (17) **B1**

Answer: E) 17

Question 8

D (hydrochloric acid) **B1**

Answer: D) hydrochloric acid

Question 9

B (zinc chloride) **B1**

Answer: B) zinc chloride

Question 10

C (164) **B1**

Answer: C) 164

Question 11

E (glucose) **B1**

Answer: E) glucose

Question 12

A (zinc chloride) **B1**

Answer: A) zinc chloride

Question 13

Calcium chloride (oe) **B1**

Answer: Calcium chloride

Question 14

18 (oe) **B1**

Answer: 18

Question 15

A (160) **B1**

Answer: A) 160

Question 16

E (carbon monoxide) **B1**

Answer: E) carbon monoxide

Question 17

C (zinc sulfate) **B1**

Answer: C) zinc sulfate

Question 18

Iron nitrate (oe) **B1**

Answer: Iron nitrate

Question 19

B (46) **B1**

Answer: B) 46

Question 20

D (sodium chloride) **B1**

Answer: D) sodium chloride

Question 21

B (potassium nitrate) **B1**

Answer: B) potassium nitrate

Question 22

Iron sulfate and hydrogen (oe) **B1**

Answer: Iron sulfate and hydrogen

Question 23

E (78) **B1**

Answer: E) 78

Question 24

A (95) **B1**

Answer: A) 95

Question 25

A (nitrogen gas) **B1**

Answer: A) nitrogen gas

Question 26

D (calcium nitrate) **B1**

Answer: D) calcium nitrate

Question 27

No reaction (oe) **B1**

Answer: No reaction

Question 28

C (64) **B1**

Answer: C) 64

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Question 29

C (H_2O) **B1**

Answer: C) H_2O

Question 30

D (copper chloride) **B1**

Answer: D) copper chloride

Question 31

Zinc chloride and hydrogen (oe) **B1**

Answer: Zinc chloride and hydrogen

Question 32

B (142) **B1**

Answer: B) 142

Question 33

A (CO) **B1**

Answer: A) CO

Question 34

E (iron(II) chloride) **B1**

Answer: E) iron(II) chloride

Question 35

E (nitric acid) **B1**

Answer: E) nitric acid

Question 36

12 (oe) **B1**

Answer: 12

Question 37

E (56) **B1**

Answer: E) 56

Question 38

C (H_2SO_4) **B1**

Answer: C) H_2SO_4

Question 39

B (calcium nitrate) **B1**

Answer: B) calcium nitrate

Question 40

D (102) **B1**

Answer: D) 102

Question 41

A ($Ca(OH)_2$) **B1**

Answer: A) $Ca(OH)_2$

Question 42

D (zinc nitrate) **B1**

Answer: D) zinc nitrate

Question 43

Acidic (oe) **B1**

Answer: Acidic

Question 44

E (44) **B1**

Answer: E) 44

Question 45

D (NaCl) **B1**

Answer: D) NaCl

Question 46

C (NaOH) **B1**

Answer: C) NaOH

Question 47

A (potassium chloride) **B1**

Answer: A) potassium chloride

Question 48

18.0 C (oe) **B1**

Answer: 18.0 C

Question 49

B (O_2) **B1**

Answer: B) O_2

Question 50

D (potassium sulfate) **B1**

Answer: D) potassium sulfate

Question 51

16 (oe) **B1**

Answer: 16

Question 52

A (CH_4) **B1**

Answer: A) CH_4

Question 53

C (calcium chloride) **B1**

Answer: C) calcium chloride

Question 54

9 (oe) **B1**

Answer: 9

Question 55

B (H_2) **B1**

Answer: B) H_2

Question 56

C (chlorine) **B1**

Answer: C) chlorine

Question 57

E (copper nitrate) **B1**

Answer: E) copper nitrate

Question 58

19 (oe) **B1**

Answer: 19

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Question 59

B ($C_6H_{12}O_6$) **B1**

Answer: B) $C_6H_{12}O_6$

Question 60

C (calcium chloride) **B1**

Answer: C) calcium chloride

Question 61

Aluminium sulfate and hydrogen (oe) **B1**

Answer: Aluminium sulfate and hydrogen

Question 62

B (blue) **B1**

Answer: B) blue

Question 63

B (pH 5) **B1**

Answer: B) pH 5

Question 64

C (water) **B1**

Answer: C) water

Question 65

82 s (oe) **B1**

Answer: 82 s

Question 66

A (36.5) **B1**

Answer: A) 36.5

Question 67

D (sodium chloride solution) **B1**

Answer: D) sodium chloride solution

Question 68

E (NH_3) **B1**

Answer: E) NH_3

Question 69

E (oxygen) **B1**

Answer: E) oxygen

Question 70

A (pH 8) **B1**

Answer: A) pH 8

Question 71

B (water) **B1**

Answer: B) water

Question 72

10 (oe) **B1**

Answer: 10

Question 73

C (98) **B1**

Answer: C) 98

Question 74

C (sodium hydroxide solution) **B1**

Answer: C) sodium hydroxide solution

Question 75

B (oxygen gas) **B1**

Answer: B) oxygen gas

Question 76

E (a glowing splint relights) **B1**

Answer: E) a glowing splint relights

Question 77

D (red) **B1**

Answer: D) red

Question 78

A (strongly alkaline) **B1**

Answer: A) strongly alkaline

Question 79

A (magnesium nitrate) **B1**

Answer: A) magnesium nitrate

Question 80

16 (oe) **B1**

Answer: 16

Question 81

C (101) **B1**

Answer: C) 101

Question 82

D (oven cleaner) **B1**

Answer: D) oven cleaner

Question 83

B ($CaCO_3$) **B1**

Answer: B) $CaCO_3$

Question 84

E (carbon dioxide) **B1**

Answer: E) carbon dioxide

Question 85

E (red) **B1**

Answer: E) red

Question 86

D (pH 4) **B1**

Answer: D) pH 4

Question 87

B (hydrogen) **B1**

Answer: B) hydrogen

Question 88

Zinc chloride (oe) **B1**

Answer: Zinc chloride

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Question 89

A (56) **B1**

Answer: A) 56

Question 90

C (vinegar) **B1**

Answer: C) vinegar

Question 91

A (HCl) **B1**

Answer: A) HCl

Question 92

B (ammonia) **B1**

Answer: B) ammonia

Question 93

E (purple) **B1**

Answer: E) purple

Question 94

C (weakly alkaline) **B1**

Answer: C) weakly alkaline

Question 95

D (magnesium sulfate) **B1**

Answer: D) magnesium sulfate

Question 96

Magnesium sulfate (oe) **B1**

Answer: Magnesium sulfate

Question 97

C (16) **B1**

Answer: C) 16

Question 98

E (N_2) **B1**

Answer: E) N_2

Question 99

A (hydrogen) **B1**

Answer: A) hydrogen

Question 100

B (purple) **B1**

Answer: B) purple

Question 101

E (pH 14) **B1**

Answer: E) pH 14

Question 102

C (hydrogen) **B1**

Answer: C) hydrogen

Question 103

1 (oe) **B1**

Answer: 1

Question 104

A (106) **B1**

Answer: A) 106

Question 105

B (sugar solution) **B1**

Answer: B) sugar solution

Question 106

D (SO_2) **B1**

Answer: D) SO_2

Question 107

D (damp litmus paper is bleached white) **B1**

Answer: D) damp litmus paper is bleached white

Question 108

B (blue) **B1**

Answer: B) blue

Question 109

C (weakly alkaline) **B1**

Answer: C) weakly alkaline

Question 110

E (magnesium sulfate) **B1**

Answer: E) magnesium sulfate

Question 111

Zinc sulfate and hydrogen (oe) **B1**

Answer: Zinc sulfate and hydrogen

Question 112

A (84) **B1**

Answer: A) 84

Question 113

D (pure water) **B1**

Answer: D) pure water

Question 114

B (MgO) **B1**

Answer: B) MgO

Question 115

A (a lit splint makes a squeaky pop) **B1**

Answer: A) a lit splint makes a squeaky pop

Question 116

C (blue) **B1**

Answer: C) blue

Question 117

E (strongly acidic) **B1**

Answer: E) strongly acidic

Question 118

C (sodium chloride) **B1**

Answer: C) sodium chloride

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Question 119

No reaction (oe) **B1**

Answer: No reaction

Question 120

B (60%) **B1**

Answer: B) 60%

Question 121

D (nitric acid) **B1**

Answer: D) nitric acid

Question 122

E (hydrogen peroxide) **B1**

Answer: E) hydrogen peroxide

Question 123

A (damp red litmus paper turns blue) **B1**

Answer: A) damp red litmus paper turns blue

Question 124

D (colourless) **B1**

Answer: D) colourless

Question 125

B (weakly alkaline) **B1**

Answer: B) weakly alkaline

Question 126

C (sodium nitrate) **B1**

Answer: C) sodium nitrate

Question 127

8 (oe) **B1**

Answer: 8

Question 128

A (58) **B1**

Answer: A) 58

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