3.11 Chemistry: The Periodic Table and Separating Mixtures: 1-hour Pack

Total Marks

ISEB CE 13+ Science (Chemistry) · Calculator allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Which element has the chemical symbol Mg?

- ☐ A) silicon
- ☐ B) tin
- ☐ C) iodine
- ☐ D) magnesium
- ☐ E) silver

---

2 Copper sulfate is a mixture of copper sulfate crystals and insoluble copper oxide. Tom wants to obtain a sample of pure copper sulfate solution from a sample of copper sulfate. Tom first dissolves the copper sulfate in water. Name the process he should use next to remove the insoluble copper oxide from the mixture.

(1)

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3 In paper chromatography, a green dye moves 2 cm from the start line while the solvent front moves 4 cm. Calculate the Rf value.

- ☐ A) 0.5
- ☐ B) 8
- ☐ C) 5
- ☐ D) 2
- ☐ E) 6

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4 An element has the electron arrangement 2,7. In which group of the periodic table is it?

- ☐ A) Group 6
- ☐ B) Group 0
- ☐ C) Group 5
- ☐ D) Group 7
- ☐ E) Group 1

---

5 In which part of the periodic table is helium found?

- ☐ A) the transition metals
- ☐ B) Group 1 (alkali metals)
- ☐ C) Group 7 (halogens)
- ☐ D) Group 2
- ☐ E) Group 0 (noble gases)

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6 Which method is best for separating coffee grounds from coffee?

- ☐ A) distillation
- ☐ B) filtration
- ☐ C) using a magnet
- ☐ D) chromatography
- ☐ E) evaporation

---

7 Which element has the chemical symbol Be?

- ☐ A) gold
- ☐ B) silicon
- ☐ C) beryllium
- ☐ D) nickel
- ☐ E) fluorine

---

8 A pupil investigates how wind speed affects the evaporation of water from an open dish. She sets up four identical dishes of water and exposes them to different wind speeds: none, light, moderate and strong. She measures the volume of water remaining after 24 hours. State the independent variable in this investigation.

(1)

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9 In paper chromatography, a yellow dye moves 3 cm from the start line while the solvent front moves 5 cm. Calculate the Rf value.

- [ ] A) 0.6
- [ ] B) 2
- [ ] C) 15
- [ ] D) 8
- [ ] E) 6

---

10 An element has the electron arrangement 2,8,7. In which group of the periodic table is it?

- [ ] A) Group 1
- [ ] B) Group 4
- [ ] C) Group 2
- [ ] D) Group 0
- [ ] E) Group 7

---

11 In which part of the periodic table is sodium found?

- [ ] A) Group 0 (noble gases)
- [ ] B) Group 7 (halogens)
- [ ] C) Group 1 (alkali metals)
- [ ] D) Group 2
- [ ] E) the transition metals

---

12 Which method is best for separating sand from a mixture of sand and water?

- [ ] A) using a magnet
- [ ] B) chromatography
- [ ] C) distillation
- [ ] D) filtration
- [ ] E) evaporation

---

13 In simple distillation of alcohol and water, the alcohol vapour rises into a tube surrounded by cold water. Name the apparatus where the vapour is cooled and condenses.

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.....

(1)

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14 A blue dye has an Rf value of 0.5 in a solvent. The solvent front moves 8 cm. How far does the dye move from the start line, in cm?

- [ ] A) 4 cm
- [ ] B) 40 cm
- [ ] C) 7.5 cm
- [ ] D) 8.5 cm
- [ ] E) 16 cm

---

15 An element has the electron arrangement 2,8,8,1. In which group of the periodic table is it?

- [ ] A) Group 2
- [ ] B) Group 1
- [ ] C) Group 3
- [ ] D) Group 0
- [ ] E) Group 6

---

16 Which of these elements is NOT in Group 2?

- [ ] A) strontium
- [ ] B) beryllium
- [ ] C) chromium
- [ ] D) barium
- [ ] E) magnesium

---

17 Which method is best for obtaining pure water from salt water?

- [ ] A) filtration
- [ ] B) evaporation
- [ ] C) using a magnet
- [ ] D) chromatography
- [ ] E) distillation

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18 What is the chemical symbol for chlorine?

- ☐ A) Mg
- ☐ B) Au
- ☐ C) Sn
- ☐ D) Cl
- ☐ E) Al

---

19 William wants to separate a mixture of clay and water using filtration. Name the piece of apparatus placed under the filter funnel to collect the filtered liquid.

.....

.....

(1)

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20 A red dye has an Rf value of 0.8 in a solvent. The solvent front moves 4 cm. How far does the dye move from the start line, in cm?

- ☐ A) 5 cm
- ☐ B) 32 cm
- ☐ C) 3.2 cm
- ☐ D) 4.8 cm
- ☐ E) 0.2 cm

---

21 An element has the electron arrangement 2,8,2. In which group of the periodic table is it?

- ☐ A) Group 6
- ☐ B) Group 7
- ☐ C) Group 0
- ☐ D) Group 1
- ☐ E) Group 2

---

22 Which of these elements is NOT in Group 1 (alkali metals)?

- ☐ A) manganese
- ☐ B) caesium
- ☐ C) rubidium
- ☐ D) potassium
- ☐ E) sodium

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23 Which method is best for removing insoluble chalk powder from water?

- ☐ A) chromatography
- ☐ B) filtration
- ☐ C) distillation
- ☐ D) evaporation
- ☐ E) using a magnet

---

24 Which element has the chemical symbol Ne?

- ☐ A) gold
- ☐ B) hydrogen
- ☐ C) sulfur
- ☐ D) neon
- ☐ E) lithium

---

25 A mixture of plant pigments is separated using paper chromatography. A single pigment in the mixture travels 5.0 cm from the baseline while the solvent front travels 10.0 cm. Calculate the Rf value of this pigment.

(1)

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26 What is the electron arrangement of fluorine (atomic number 9)?

- ☐ A) 2,8,8,1
- ☐ B) 2,3
- ☐ C) 2,8,8
- ☐ D) 2,8,7
- ☐ E) 2,7

---

27 In which part of the periodic table is fluorine found?

- ☐ A) Group 2
- ☐ B) Group 1 (alkali metals)
- ☐ C) Group 7 (halogens)
- ☐ D) Group 0 (noble gases)
- ☐ E) the transition metals

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28 What is the chemical symbol for beryllium?

- [ ] A) Be
- [ ] B) Si
- [ ] C) I
- [ ] D) Mg
- [ ] E) S

---

29 Magnesium sulfate is dissolved in water. Ulrich wants to obtain dry magnesium sulfate crystals. Name the process Ulrich should use to obtain dry crystals from the magnesium sulfate solution.

(1)

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30 In paper chromatography, a yellow dye moves 6 cm from the start line while the solvent front moves 8 cm. Calculate the Rf value.

- [ ] A) 2
- [ ] B) 48
- [ ] C) 14
- [ ] D) 0.75
- [ ] E) 7.5

---

31 An atom of chlorine has atomic number 17 and mass number 35. How many neutrons does it have?

- [ ] A) 18
- [ ] B) 15
- [ ] C) 17
- [ ] D) 16
- [ ] E) 35

---

32 Which of these elements is NOT in Group 0 (noble gases)?

- [ ] A) xenon
- [ ] B) helium
- [ ] C) neon
- [ ] D) argon
- [ ] E) cobalt

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33 What is the chemical symbol for silicon?

- [ ] A) Ne
- [ ] B) K
- [ ] C) Si
- [ ] D) N
- [ ] E) O

---

34 A mixture of amino acids is separated using paper chromatography. A single amino acid in the mixture travels 3.2 cm from the baseline while the solvent front travels 8.0 cm. Calculate the Rf value of this amino acid.

(1)

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35 A purple dye has an Rf value of 0.2 in a solvent. The solvent front moves 8 cm. How far does the dye move from the start line, in cm?

- [ ] A) 7.8 cm
- [ ] B) 0.025 cm
- [ ] C) 40 cm
- [ ] D) 1.6 cm
- [ ] E) 8.2 cm

---

36 What is the electron arrangement of sulfur (atomic number 16)?

- [ ] A) 2,8,8
- [ ] B) 2,8,6
- [ ] C) 2,8
- [ ] D) 1
- [ ] E) 2,8,8,2

---

37 Which of these elements is NOT in Group 1 (alkali metals)?

- [ ] A) rubidium
- [ ] B) lithium
- [ ] C) potassium
- [ ] D) calcium
- [ ] E) caesium

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38 What is the chemical symbol for oxygen?

- [ ] A) Au
- [ ] B) N
- [ ] C) Ca
- [ ] D) H
- [ ] E) O

---

39 Mineral salt is a mixture of mineral salt and insoluble stone particles. Jamal wants to obtain a sample of pure mineral salt from the mixture. Jamal first dissolves the mineral salt in water. Name the process he should use next to remove the insoluble stone particles from the mixture.

(1)

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40 An atom of helium has atomic number 2 and mass number 4. How many neutrons does it have?

- [ ] A) 5
- [ ] B) 2
- [ ] C) 4
- [ ] D) 6
- [ ] E) 1

---

41 Which of these elements is NOT in Group 7 (halogens)?

- [ ] A) magnesium
- [ ] B) chlorine
- [ ] C) fluorine
- [ ] D) iodine
- [ ] E) bromine

---

42 What is the chemical symbol for potassium?

- [ ] A) Ar
- [ ] B) Ni
- [ ] C) Sn
- [ ] D) K
- [ ] E) Mg

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43 In paper chromatography, a blue dye moves 5 cm from the start line while the solvent front moves 20 cm. Calculate the Rf value.

- [ ] A) 4
- [ ] B) 15
- [ ] C) 25
- [ ] D) 100
- [ ] E) 0.25

---

44 What is the electron arrangement of magnesium (atomic number 12)?

- [ ] A) 2,8,4
- [ ] B) 2,8,2
- [ ] C) 2,8,7
- [ ] D) 2,8
- [ ] E) 2,5

---

45 Which of these elements is NOT in Group 7 (halogens)?

- [ ] A) copper
- [ ] B) fluorine
- [ ] C) chlorine
- [ ] D) bromine
- [ ] E) iodine

---

46 What is the chemical symbol for copper?

- [ ] A) He
- [ ] B) H
- [ ] C) Cu
- [ ] D) Na
- [ ] E) Pb

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47 In paper chromatography, a blue dye moves 2 cm from the start line while the solvent front moves 8 cm. Calculate the Rf value.

- [ ] A) 10
- [ ] B) 6
- [ ] C) 4
- [ ] D) 16
- [ ] E) 0.25

---

48 An atom of beryllium has atomic number 4 and mass number 9. How many neutrons does it have?

- [ ] A) 2
- [ ] B) 5
- [ ] C) 9
- [ ] D) 8
- [ ] E) 4

---

49 Which of these elements is NOT in Group 7 (halogens)?

- [ ] A) chlorine
- [ ] B) fluorine
- [ ] C) iodine
- [ ] D) cobalt
- [ ] E) bromine

---

50 What is the chemical symbol for nitrogen?

- [ ] A) N
- [ ] B) Ag
- [ ] C) Zn
- [ ] D) P
- [ ] E) Be

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51 In paper chromatography, a green dye moves 3 cm from the start line while the solvent front moves 12 cm. Calculate the Rf value.

- [ ] A) 9
- [ ] B) 4
- [ ] C) 0.25
- [ ] D) 36
- [ ] E) 15

---

52 What is the electron arrangement of boron (atomic number 5)?

- [ ] A) 2,8,8,2
- [ ] B) 2,3
- [ ] C) 2,8,8
- [ ] D) 2,8,2
- [ ] E) 2,8,7

---

53 What is the chemical symbol for helium?

- [ ] A) P
- [ ] B) Al
- [ ] C) Ag
- [ ] D) He
- [ ] E) Na

---

54 In paper chromatography, a purple dye moves 4 cm from the start line while the solvent front moves 5 cm. Calculate the Rf value.

- [ ] A) 1
- [ ] B) 1.25
- [ ] C) 20
- [ ] D) 9
- [ ] E) 0.8

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55 An atom of nitrogen has atomic number 7 and mass number 14. How many neutrons does it have?

- [ ] A) 7
- [ ] B) 10
- [ ] C) 5
- [ ] D) 6
- [ ] E) 14

---

56 Which of these elements is NOT in Group 0 (noble gases)?

- [ ] A) chlorine
- [ ] B) krypton
- [ ] C) neon
- [ ] D) argon
- [ ] E) helium

---

57 What is the chemical symbol for phosphorus?

- [ ] A) Pb
- [ ] B) Cu
- [ ] C) S
- [ ] D) N
- [ ] E) P

---

58 A purple dye has an Rf value of 0.2 in a solvent. The solvent front moves 10 cm. How far does the dye move from the start line, in cm?

- [ ] A) 9.8 cm
- [ ] B) 2 cm
- [ ] C) 50 cm
- [ ] D) 10.2 cm
- [ ] E) 0.02 cm

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59 An atom of oxygen has atomic number 8 and mass number 16. How many neutrons does it have?

- [ ] A) 6
- [ ] B) 12
- [ ] C) 5
- [ ] D) 8
- [ ] E) 9

---

60 Which of these elements is NOT in the transition metals?

- [ ] A) titanium
- [ ] B) manganese
- [ ] C) potassium
- [ ] D) nickel
- [ ] E) iron

---

61 Elements can be classified as metals or non-metals based on their physical properties.

(a) State two physical properties typical of metals. **(2)**

(b) State two physical properties typical of non-metals. **(2)**

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Mark scheme · 3.11 Chemistry: The Periodic Table and Separating Mixtures: 1-hour Pack

Question 1

D (magnesium) **B1**

Answer: D) magnesium

Question 2

Filtration (oe) **B1**

Answer: Filtration

Question 3

A (0.5) **B1**

Answer: A) 0.5

Question 4

D (Group 7) **B1**

Answer: D) Group 7

Question 5

E (Group 0 (noble gases)) **B1**

Answer: E) Group 0 (noble gases)

Question 6

B (filtration) **B1**

Answer: B) filtration

Question 7

C (beryllium) **B1**

Answer: C) beryllium

Question 8

Wind speed (oe) **B1**

Answer: Wind speed

Question 9

A (0.6) **B1**

Answer: A) 0.6

Question 10

E (Group 7) **B1**

Answer: E) Group 7

Question 11

C (Group 1 (alkali metals)) **B1**

Answer: C) Group 1 (alkali metals)

Question 12

D (filtration) **B1**

Answer: D) filtration

Question 13

Condenser (oe) **B1**

Answer: Condenser

Question 14

A (4 cm) **B1**

Answer: A) 4 cm

Question 15

B (Group 1) **B1**

Answer: B) Group 1

Question 16

C (chromium) **B1**

Answer: C) chromium

Question 17

E (distillation) **B1**

Answer: E) distillation

Question 18

D (Cl) **B1**

Answer: D) Cl

Question 19

Beaker (oe) **B1**

Answer: Beaker

Question 20

C (3.2 cm) **B1**

Answer: C) 3.2 cm

Question 21

E (Group 2) **B1**

Answer: E) Group 2

Question 22

A (manganese) **B1**

Answer: A) manganese

Question 23

B (filtration) **B1**

Answer: B) filtration

Question 24

D (neon) **B1**

Answer: D) neon

Question 25

0.5 (oe) **B1**

Answer: 0.5

Question 26

E (2,7) **B1**

Answer: E) 2,7

Question 27

C (Group 7 (halogens)) **B1**

Answer: C) Group 7 (halogens)

Question 28

A (Be) **B1**

Answer: A) Be

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Question 29

Evaporation (oe) **B1**

Answer: Evaporation

Question 30

D (0.75) **B1**

Answer: D) 0.75

Question 31

A (18) **B1**

Answer: A) 18

Question 32

E (cobalt) **B1**

Answer: E) cobalt

Question 33

C (Si) **B1**

Answer: C) Si

Question 34

0.4 (oe) **B1**

Answer: 0.4

Question 35

D (1.6 cm) **B1**

Answer: D) 1.6 cm

Question 36

B (2,8,6) **B1**

Answer: B) 2,8,6

Question 37

D (calcium) **B1**

Answer: D) calcium

Question 38

E (O) **B1**

Answer: E) O

Question 39

Filtration (oe) **B1**

Answer: Filtration

Question 40

B (2) **B1**

Answer: B) 2

Question 41

A (magnesium) **B1**

Answer: A) magnesium

Question 42

D (K) **B1**

Answer: D) K

Question 43

E (0.25) **B1**

Answer: E) 0.25

Question 44

B (2,8,2) **B1**

Answer: B) 2,8,2

Question 45

A (copper) **B1**

Answer: A) copper

Question 46

C (Cu) **B1**

Answer: C) Cu

Question 47

E (0.25) **B1**

Answer: E) 0.25

Question 48

B (5) **B1**

Answer: B) 5

Question 49

D (cobalt) **B1**

Answer: D) cobalt

Question 50

A (N) **B1**

Answer: A) N

Question 51

C (0.25) **B1**

Answer: C) 0.25

Question 52

B (2,3) **B1**

Answer: B) 2,3

Question 53

D (He) **B1**

Answer: D) He

Question 54

E (0.8) **B1**

Answer: E) 0.8

Question 55

A (7) **B1**

Answer: A) 7

Question 56

A (chlorine) **B1**

Answer: A) chlorine

Question 57

E (P) **B1**

Answer: E) P

Question 58

B (2 cm) **B1**

Answer: B) 2 cm

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Question 59

D (8) **B1**

Answer: D) 8

Question 60

C (potassium) **B1**

Answer: C) potassium

Question 61

(a) any one of: shiny/lustrous, good conductor of heat and electricity, malleable/ductile, high melting and boiling point, sonorous (makes a ringing sound), high density **B1**

(a) a second, different valid property from the list above **B1**

(a) Answer: Any two of: shiny; good conductor of heat and electricity; malleable/ductile; high melting point; sonorous; high density.

(b) any one of: dull appearance, poor conductor of heat and electricity (insulator), brittle when solid, low melting and boiling point, low density **B1**

(b) a second, different valid property from the list above **B1**

(b) Answer: Any two of: dull appearance; poor conductor of heat and electricity; brittle when solid; low melting point; low density.

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