KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10

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PHYSICAL SCIENCES P2

COMMON TEST
MARKING MEMORANDUM
JUNE 2025

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MARKS: 75

DURATION: 1,5 hours

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1.1 B ✓✓ (2)
1.2 A ✓✓ (2)
1.3 C ✓✓ (2)
1.4 C ✓✓ (2)
1.5 A ✓✓ (2)
[10]

QUESTION 2

2.1

2.1.1 The food colouring moves from an area of higher concentration ✓ to an area of lower concentration. ✓

OR

The food colouring diffuses✓ in water✓. (2)

2.1.2 Mixture. ✓ (1)

2.1.3 Physical (change). ✓
No new substance is formed. ✓ (2)

2.1.4 At higher temperatures the particles have more kinetic energy OR at higher temperatures the particles move faster. ✓
This allows the food colouring to diffuse (or spread out) faster. ✓ (2)

2.2

2.2.1 $Na_2CO_3(s) + 2HCl(aq) \rightarrow 2NaCl(aq) + CO_2(g) + H_2O(l)$
Criteria:
Formula: Na_2CO_3 ✓
Formula: NaCl ✓
Formula: CO_2, H_2O ✓
Balancing ✓ (Note: Do not penalise if the phase is omitted) (4)

2.2.2 The solution is in an aqueous phase. ✓ (Accept: aqueous ✓) (1)

2.2.3 Bubbles are observed. ✓
Carbon dioxide is a gas OR A gas is formed. ✓ (2)

2.3

2.3.1 Iron (III) Chloride ✓✓ (Note: Iron Chloride ½) (2)

2.3.2 Mass of reactants = 56 + 35,5x3 + 3(23 + 16 + 1) ✓
= 282,5 $g.mol^{-1}$
Mass of products = 56 + 3(16 + 1) + 3(23 + 35,5)✓
= 282,5 $g.mol^{-1}$
Mass of reactants is equal to the mass of products. (Therefore mass is conserved.) ✓ (3)
[19]

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QUESTION 3

3.1 The temperature at which a solid, given sufficient heat, becomes a liquid. ✓✓ (2)

3.2

3.2.1 A ✓ (1)

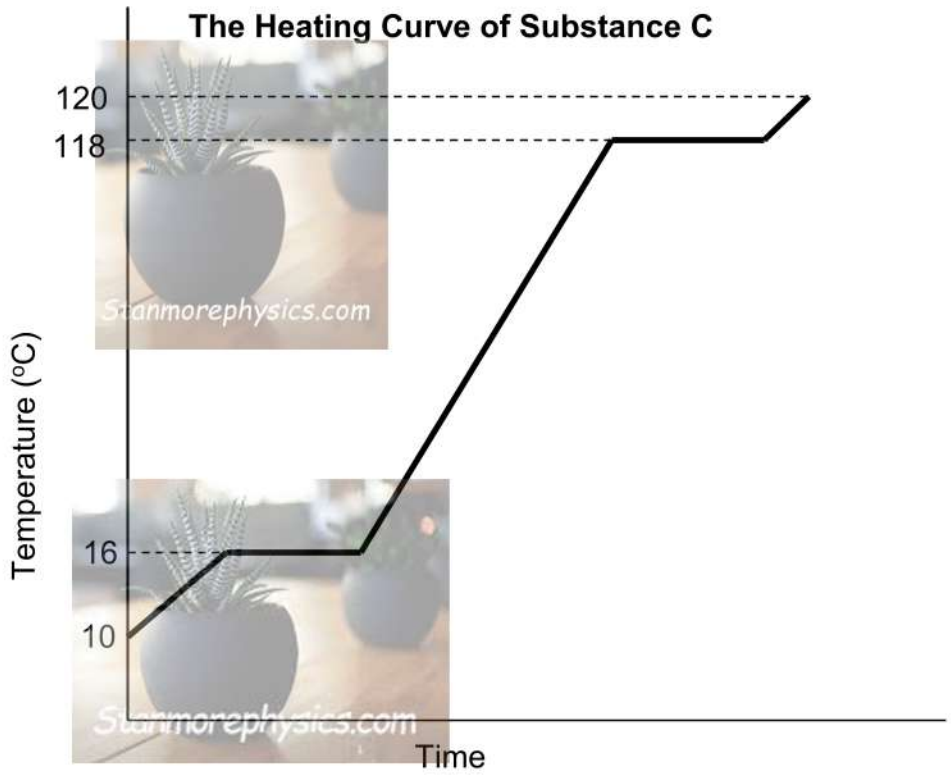
3.2.2 C ✓ (1)

3.2.3 B ✓ (1)

3.2.4 C ✓

It has the highest melting point/ boiling point/ melting and boiling points. ✓ (2)

3.3



Criteria:

Shape:

Temperature increase as time increase (except during phase change). ✓

Temperature constant during phase change. ✓

Values on y-axis:

Initial and final temperature : 10 and 120 °C ✓

Melting Point: 16 °C ✓

Boiling point: 118 °C ✓ (5)

3.4 Evaporation takes place (on the surface of a liquid) when the molecules with the highest kinetic energy are able to escape. ✓

The average kinetic energy of the liquid decreases. ✓

The temperature of a substance is the measure of the average kinetic energy of the particles. ✓ (3)

[15]

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QUESTION 4

4.1 The energy needed per mole to remove an electron from an atom in the gaseous state. ✓✓ (2)

4.2 As you move down the group the atomic radius increases. ✓
The force of attraction between the nucleus and valence electrons decrease.✓ (2)

4.3 Greater than ✓
As you move from left to right across a period the effective nuclear charge increase OR the atomic radius decreases. ✓
The force of attraction between the nucleus and the outer orbital increases. ✓ (3)

4.4 The reactivity of group 1 elements increase from top to bottom. ✓
The ionization energy decrease from top to bottom in the group. ✓
Therefore it is easier to remove a valence electron. ✓ (3)

[10]

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QUESTION 5

5.1

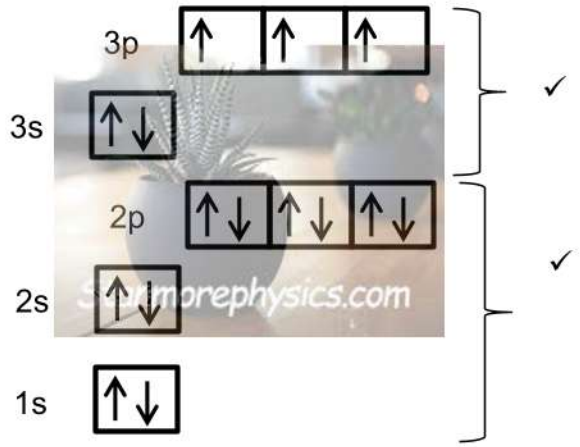
5.1.1 A ✓ (1)

5.1.2 C ✓ (1)

5.1.3 D ✓ (1)

5.1.4 B ✓ (1)

5.2.1



✓

✓

(2)

5.2.2 **POSITIVE MARKING FROM 5.2.1** (i.e. based on the chosen Element)

(a): P^{3-} /P^{-3} ✓

(b): Phosphide ion ✓

(c): 15 ✓

(d): 18 ✓

(e): 16 ✓

(5)

[11]

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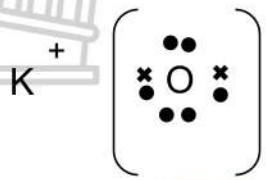
QUESTION 6

6.1

6.1.1 Ionic bond ✓ (1)

6.1.2 (3)

OPTION 1



K + ✓✓

OPTION 2



✓✓

Note: Accept any alternative arrangement of bonded paired / lone-pairs

6.2.1

(a) Atomic mass of Potassium – A : 20 + 19 = 39 (AMU)✓ (1)

(b) Atomic mass of Potassium – B : 22 + 19 = 41 (AMU) ✓ (1)

6.2.2 **POSITIVE MARKING FROM 6.2.1**

Let the percentage abundance of Potassium – A be X

✓ ✓ ✓

$$39{,}13 = 39 \times \frac{X}{100} + 41\left(\frac{100 - X}{100}\right)$$

x = 93,5 % ✓ (4)

[10]

TOTAL: 75

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