1.1 Matter, Chemical Change & the Mole Concept

Question Paper

Course	DP IB Chemistry
Section	1. Stoichiometric Relationships
Topic	1.1 Matter, Chemical Change & the Mole Concept
Difficulty	Medium

Time allowed: 20

Score: /10

Percentage: /100

A compound of molar mass 92 gmol⁻¹ contains 12g of carbon, 2g of hydrogen and 32g of oxygen. What is the molecular formula of the compound?

- $A \quad CH_2O_2$
- B CH₂O
- \mathbf{C} $C_2H_4O_2$
- \mathbf{D} $C_2H_4O_4$

[1 mark]

Question 2

When lead sulfide reacts with oxygen it produces lead(II)oxide and sulfur dioxide according to the equation below:

$$PbS(s) + O_2(g) \rightarrow PbO(s) + SO_2(g)$$

What is the whole number sum of the coefficients in the balanced equation?

- **A** 4
- **B** 5
- **C** 8
- **D** 9

A compound is made of sulfur and oxygen only. A sample of the compound has a mass of 8.0g, and consists of 3.2g of sulfur and 4.8g of oxygen. The empirical formula of the compound is:

(RAMs S = 32.0, O = 16.0)

- A SO
- B SO₂
- C SO₃
- D S_2O_3

[1 mark]

Question 4

Which of these processes are endothermic?

- I. Condensing
- II. Subliming
- III. Melting
- A I and II only
- B I and III only
- C II and III only
- **D** I, II and III

Ethanoic acid has the formula CH₃COOH. How many carbon atoms are present in 0.1 mol of ethanoic acid?

- **A** 6.0×10^{22}
- **B** 1.2 x 10²³
- **C** 6.0×10^{23}
- **D** 1.2 x 10²⁴

[1 mark]

Question 6

Which of the following samples has the largest mass? (RAMs, H = 1.01, N = 14.01, O = 16.00)

- \mathbf{A} 2.0 mol of NH_4^+
- **B** 1.0 mol of H_2S
- **C** 1.0 mol of H_2O_2
- **D** 2.0 mol of OH⁻

A compound contains carbon and hydrogen only. The amount of carbon is 80% by mass. What is the empirical formula of the compound?

(RAMs, H = 1.01, C = 12.01)

- A CH
- B CH₂
- C CH₃
- D CH₄

[1 mark]

Question 8

A periodic table is needed to answer this question

A hydrated carbonate of an unknown Group 1 metal has the formula X₂CO₃·10H₂O and is found to have a relative formula mass of 286.19

What is the group 1 metal?

- A Rb
- B K
- C Na
- **D** Li

The diagram below shows the skeletal formula of phenazine.

Phenazine

What is the empirical formula of phenazine?

- $A C_6H_6N$
- **B** $C_{12}H_8N_2$
- \mathbf{C} C_6H_4N
- **D** $C_{12}H_{12}N_2$

A periodic table is needed to answer this question

A coin contains 5.869% Nickel by mass. If the coin weighs 10.00g, how many Nickel atoms are in the coin?

- **A** 4.30 x 10²²
- **B** 3.01 x 10²³
- **C** 6.02 x 10²⁵
- **D** 6.02×10^{21}