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

Question 1

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 CH_2O_2

B CH_2O

C $C_2H_4O_2$

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

[1 mark]

Question 3

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 SO_2

C SO_3

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

[1 mark]

Question 5

Ethanoic acid has the formula CH_3COOH. How many carbon atoms are present in 0.1 mol of ethanoic acid?

A 6.0×10^{22}

B 1.2×10^{23}

C 6.0×10^{23}

D 1.2×10^{24}

[1 mark]

Question 6

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

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^-

[1 mark]

Question 7

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 CH_2

C CH_3

D CH_4

[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 $X_2CO_3 \cdot 10H_2O$ and is found to have a relative formula mass of 286.19

What is the group 1 metal?

A Rb

B K

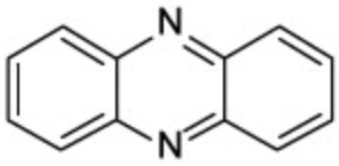
C Na

D Li

[1 mark]

Question 9

The diagram below shows the skeletal formula of phenazine.



Phenazine

What is the empirical formula of phenazine?

A C_6H_6N

B $C_{12}H_8N_2$

C C_6H_4N

D $C_{12}H_{12}N_2$

[1 mark]

Question 10

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 4.30×10^{22}

B 3.01×10^{23}

C 6.02×10^{25}

D 6.02×10^{21}

[1 mark]