

LEAVING CERTIFICATE EXAMINATION, 1968

CHEMISTRY - PASS

FRIDAY, 21st JUNE - Afternoon, 2.30 to 5

Six questions to be answered.Atomic Weights: $H = 1$, $C = 12$, $N = 14$, $O = 16$, $S = 32$, $Cl = 35.5$, $Br = 80$.

1. Describe fully what you understand by (i) a covalent bond, (ii) an electrovalent bond. Give an example in each case.

Outline the typical properties of covalent compounds.

(66 marks)

2. With regard to each of the following atoms, ${}_1H^1$, ${}_1H^2$, ${}_6C^{12}$, ${}_6C^{14}$, ${}_7N^{14}$, ${}_7N^{16}$, show by means of diagrams the composition of the nucleus and the electron arrangement.

Explain why ${}_6C^{12}$ and ${}_6C^{14}$ have almost identical chemical properties. Mention one property in which they differ.

(66 marks)

3. Describe fully how you would prepare and collect dry ammonia and give an account of its properties.

Calculate the volume of 1.2 N sulphuric acid required to neutralise the ammonia obtainable from 1.07 gm. of ammonium chloride.

Describe briefly the structure of a molecule of ammonia.

(66 marks)

4. Compare nitrous oxide, nitric oxide and nitrogen dioxide with regard to their physical and chemical properties.

Describe fully how you would prepare and collect any one of the above oxides and indicate its structure diagrammatically.

(66 marks)

5. Give the structural formula and the principal physical and chemical properties of (i) acetic acid, (ii) ethyl alcohol.

(66 marks)

6. (i) Describe, with the aid of a sketch of the apparatus, how you would prepare and collect ethylene.

Give an account of the principal properties of ethylene and give its gravimetric composition.

(ii) Give an account of the properties of benzene. Show how it may be converted into nitrobenzene and mention the principal properties of nitrobenzene.

(66 marks)

7. (i) Describe briefly three different methods for measuring the chemical equivalent of metals.

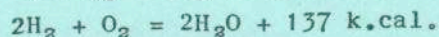
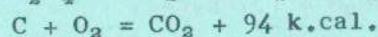
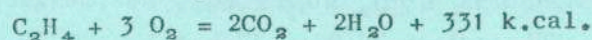
(ii) State Graham's Law of Diffusion.

A certain volume of methane diffused through a porous plate in 32 seconds. How long would it take the same volume of hydrogen bromide to diffuse through the same plate under the same conditions?

(67 marks)

8. State what you understand by (i) a calorie, (ii) the heat of formation of a compound, (iii) an exothermic reaction.

Calculate the heat of formation of ethylene from the following data:-



(67 marks)

9. Use chemical equations to illustrate:-

(i) the action of heat on (a) sodium nitrate, (b) zinc nitrate;

(ii) the action of water on (a) magnesium, (b) fluorine;

(iii) the action of concentrated sulphuric acid on (a) copper, (b) carbon, (c) formic acid.

Refer to the conditions under which the reactions take place and name the products in each case.

(67 marks)

10. Write notes on each of the following:-

(i) Brownian Movement,

(ii) The Bronsted-Lowry Theory,

(iii) The Electrochemical Series.

(67 marks)