

AN ROINN OIDEACHAIS
(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1936.

FULL COURSE.

CHEMISTRY.

FRIDAY, 19th JUNE.—AFTERNOON, 4 P.M. TO 6 P.M.

(a) Not more than six questions to be answered. All questions are of equal value.

(b) Chemical reactions should be expressed in words and represented by chemical equations.

(c) Answers should be illustrated with sketches wherever possible.

1. State Avogadro's Hypothesis and explain how it is used for fixing molecular weights.

A substance had the following percentage composition: Carbon, 24.24; hydrogen, 4.04; chlorine, 71.72. In a vapour density determination by Victor Meyer's method, 0.2 gram expelled 50 ccs. of air measured at 15 C. and 740 mm. pressure. What was the molecular weight of the substance?

(Atomic weights: Cl, 35.5; C, 12.)

2. Supposing that you were given a sample of sand containing sodium chloride, describe in detail the method by which you would determine the percentage of chlorine in the sample.

3. Describe the various allotropic forms of carbon, and contrast their properties.

4. How is carbon monoxide prepared in the laboratory?
How is it produced on a large scale?

Give an account of the properties of carbon monoxide referring to its importance in industry.

5. State what you know about the scientific work of (a) Scheele, (b) Cavendish, and (c) Black.

6. If you were given sulphur how would you make sodium sulphite from it?

20 ccs. of a solution of sodium sulphite decolourised 5 ccs. of $N/10$ permanganate. How many grams of the sulphite were contained in a litre of the solution?

(Atomic weights: Na, 23; S, 32.)

7. Sketch an apparatus for the preparation of chlorine and explain how the apparatus would be used.

How does chlorine act on (a) lime and (b) ammonia?

8. Give an account of the manufacture of sulphuric acid by the lead chamber process.

What is the chief purpose for which sulphuric acid is used in Ireland?

9. How is ethyl alcohol manufactured?

Write the constitutional formula of ethyl alcohol and explain how it has been established.

What is obtained when ethyl alcohol is treated with potassium dichromate and sulphuric acid?

10. Describe in each case *what you see* on mixing (a) solution of lead acetate with solution of potassium iodine, (b) solution of copper sulphate with hydrogen sulphide, (c) copper with strong nitric acid.

Explain these reactions.

11. Nitrogen and phosphorus are in the same group in the periodic classification of the elements. Show how this arrangement fits in with the chemical properties of these elements.

12. Explain the following terms: (a) acid salt, (b) basic salt, (c) dibasic acid, (d) peroxide. Give examples of each.