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(Department of Education.)

LEAVING CERTIFICATE EXAMINATION, 1946.

CHEMISTRY.—HONOURS.

WEDNESDAY, 19th JUNE.—MORNING, 10 TO 12.

Not more than *six* questions to be answered. All the questions have the same value.

Chemical changes should be expressed by equations as well as in words.

(Atomic weights : Na=23 ; C=12 ; O=16. Gram-molecular volume : 22.4 litres.)

1. What is meant by the equivalent of an element ?

When excess of acid was added to 0.15 gram of the carbonate of a metallic element it gave off 36 c.c. of dry carbon dioxide, measured at 20° C. and 762 mm. Find the equivalent of the element.

2. Give the name of the raw material used in the manufacture of sulphuric acid and mention some places where it is found.

Describe the lead chamber process for the manufacture of sulphuric acid.

3. Describe (with sketch of apparatus) a method for the preparation of nitrogen peroxide in the laboratory and give an account of its properties.

4. How would you demonstrate that ammonia contains one volume of nitrogen and three volumes of hydrogen ? What further data would you require in order to find the formula for ammonia ?

5. How would you obtain nitric oxide from sodium nitrate ? Describe the properties of nitric oxide.

6. Describe an electrolytic process for the manufacture of chlorine and explain, by means of the ionic theory, the reactions that take place during the process.

7. How would you obtain orthophosphoric acid and metaphosphoric acid from phosphorus ? Write the names and formulae of all the sodium salts of orthophosphoric acid.

8. Define "Standard Solution" and "Normal Solution."

11.66 grams of pure dry sodium carbonate were dissolved in water and the solution was made accurately up to 200 c.c. 25 c.c. of this solution was exactly neutralised by 22 c.c. of a certain acid solution. How would you make 1 litre of normal acid from that acid solution?

9. In a given salt, the metallic radicle is either aluminium or zinc and the acid radicle is either a chloride or a nitrate. What tests would you perform in order to find the composition of the salt?

10. Write the constitutional formula for acetic acid and give the reasons on which it is based.

11. Give the constitutional formula and the name of *one example* of each of the following classes of compound: (a) saturated hydrocarbon, (b) unsaturated hydrocarbon, (c) alcohol, (d) aldehyde.