AN ROINN OIDEACHAIS
(Department of Education).

BRAINNSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1934.

FULL COURSE.

CHEMISTRY.

FRIDAY, 15th 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. 25 c.c of a solution containing 18 gr. of a ferrous salt per litre, when titrated with 1·1 deci-normal potassium permanganate required 22·7 c.c. of the latter solution. Find the percentage of iron in the ferrous salt.
O=16; S=32; K=39; Mn=55; Fe=56.

2. How are chlorine and bleaching powder prepared commercially? Give one important technical use of each of these substances.

3. To what classes of organic compounds do butter, glucose, starch, cane sugar, petroleum and tallow belong? Give the formula for any one member in each of these classes.
Describe a method for the production of hard soap.

4. How would you (*a*) obtain "atmospheric" nitrogen, (*b*) prepare pure nitrogen? In what respect do these differ? Give two reasons for regarding air as a mechanical mixture of gases rather than as a chemical compound.

5. 0·36 gr. of magnesium when dissolved in dilute acid liberated 370 c.c. of gas measured at 750 mms. and 17° C. 1·00 gr. of the metal when oxidized in a crucible gave 1·61 gr. of oxide. Calculate the equivalent of the metal from the two sets of data and comment on the results obtained.

1 litre of hydrogen at S.T.P. weighs 0·09 gr. H=1; Mg=24·2.

6. Describe the leaden chamber process for the *manufacture* of sulphuric acid. Illustrate your answer with a diagram.

7. What do you understand by the vapour density of a substance? Describe *in detail* a method for determining the vapour density of chloroform, b. pt. 61° C.

8. Give the names and formulae of two calcium compounds found in nature. Describe methods whereby each is converted into a product of technical importance.

9. How would you prepare nitrous oxide? In what respect does it resemble oxygen? How would you differentiate between it and oxygen?

10. Give equations showing the result of interaction between the following substances:—

(*a*) ethylene and bromine,
(*b*) carbon monoxide and litharge,
(*c*) calcium bicarbonate and calcium hydrate,
(*d*) ferric chloride and sulphuretted hydrogen,
(*e*) barium chloride and copper sulphate.

Name the products formed in each case.