

# AN ROINN OIDEACHAIS

(Department of Education).

## BRAINSE AN MHEÁN-OIDEACHAIS

(Secondary Education Branch).

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LEAVING CERTIFICATE EXAMINATION, 1929.

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### HONOURS

### CHEMISTRY.

WEDNESDAY, 19th JUNE.—MORNING, 10 A.M. TO 12 NOON.

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Not more than *six* questions may be attempted.

All questions are of equal value.

1. Name and give the formulæ of three different substances which are used for drying gases, and in each case name two gases which may be dried by them.

A sample of nitrogen is known to be contaminated with oxygen, carbon dioxide and carbon monoxide. How would you obtain and collect a pure dry specimen of nitrogen?

2. Justify the classification of magnesium, calcium and barium in the same group of elements.

3. Describe as fully as possible a process by which sodium carbonate is manufactured on a large scale.

4. 5.5 grams of a mixture of ferric alum and ferrous ammonium sulphate  $[\text{Fe SO}_4 (\text{NH}_4)_2 \text{SO}_4, 6\text{H}_2\text{O}]$  are dissolved in water and the solution made up to 250 c.c. 20 c.c. of a .8 decinormal solution of potassium permanganate are required to oxidise 50 c.c. of this solution. Calculate the percentage weight of ferrous ammonium sulphate in the mixture.

How is the above titration performed?

[Fe = 56, S = 32, O = 16, H = 1, N = 14, K = 39, Mn = 55].

5. Discuss the connection between (a) specific heats and atomic weights of the elements, (b) atomic weights and equivalent weights of the elements, (c) molecular weights and densities of gases.

6. Describe in detail the method of determining gravimetrically the percentage of chlorine in barium chloride.

7. How is the presence of (a) hydrogen, (b) nitrogen detected in an organic compound.

8. Write a short account of oxides of aluminium and of iron. Explain some methods of protecting iron against rust.

9. Describe fully the preparation and properties of acetic acid. Write its structural formula.

10. Write a short account of the contribution to scientific knowledge made by any three of the following :—Boyle, Dalton, Priestly, Cavendish, Dumas, Lavoisier.