1933

Elementary Chemistry (1st Year): Technical School Examinations 1933

Department of Education: Technical Instruction Branch

COURSES IN APPLIED CHEMISTRY.

(40)

AN ROINN OIDEACHAIS.
(Department of Education.)

BRAINSE AN CHEARD-OIDEACHAIS.
(Technical Instruction Branch.)

TECHNICAL SCHOOL EXAMINATIONS.
1933.

ELEMENTARY CHEMISTRY.
(First Year.)

Friday, May 12th—7 to 10 p.m.

Examiner—A. G. G. LEONARD, ESQ., PH.D., F.R.C.SC.I., F.I.C.

Co-Examiner—E. P. BARRETT, ESQ., B.A., B.SC.

GENERAL INSTRUCTIONS.

You are carefully to enter on the Answer Book and Envelope supplied your Examination Number and the subject of examination, but you are not to write your name on either. No credit will be given for any Answer Book upon which your name is written, or upon which your Examination Number is not written.

You must not have with you any book, notes, or scribbling-paper.

You are not allowed to write or make any marks upon your paper of questions.

You must not, under any circumstances whatever, speak to or communicate with another candidate ; and no explanation of the subject of the examination may be asked for or given.

You must remain seated until your Answer Book has been taken up, and then leave the examination-room quietly. You will not be permitted to leave before the expiration of twenty minutes from the beginning of the examination, and will not be re-admitted after having once left the room.

If you break any of these rules, or use any unfair means, you are liable to be dismissed from the examination, and your examination may be cancelled by the Department.

Three hours are allowed for this paper. Answer Books, unless previously given up, will be collected at 10 p.m.

INSTRUCTIONS.

Read the General Instructions on page 1.

(*a*) Equal values are attached to the questions.

(*b*) Answers must be written in *ink*.

(*c*) Write the number of the question distinctly in the margin of your paper before the answer.

(*d*) *Eight, but not more than eight*, questions may be attempted.

(*e*) *Well defined chemical changes should be represented by equations.*

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1. How would you prepare nitric oxide and determine its density relative to hydrogen?

2. Write equations expressing the result of interaction of the following substances:—(*a*) lead nitrate and sulphuretted hydrogen; (*b*) sodium chloride and sulphuric acid; (*c*) ammonia and chlorine; (*d*) water and quicklime; (*e*) sodium hydroxide and nitric acid.

3. What do you understand by the equivalent of an element? How is this related to the atomic weight?
0.36 gm. of an element when burnt in oxygen yields 1.32 gm. of oxide; what is the equivalent of the element?

4. Describe a method for the preparation of nitrous oxide. Give the equation for the reaction and describe the more important properties of the gas.

5. What do you understand by a reducing agent? Mention two such agents and give two equations illustrating the action of each.

6. Sketch the apparatus employed by Gay Lussac to determine the volume composition of steam. How was the experiment performed and what results were obtained?

7. Describe a laboratory experiment illustrating the formation of sulphuric acid from sulphur dioxide. Give two examples of the use of the acid in industry.

8. 50 c.c. of a solution containing 60 gm. of sodium hydroxide per litre neutralizes 75 c.c. of a solution of hydrochloric acid. What weight of the acid is contained in a litre of the latter solution? H=1; O=16; Na=23; Cl=35.5.

9. Draw a sketch illustrating the essential parts of a bunsen burner. Explain how the burner works and how it may be adjusted to give flames of various heights. What experiments would you carry out to investigate the different parts of the flame?

10. Describe in detail how you would prepare hydrochloric acid gas and demonstrate its properties. Give equations for any reactions involved.

11. Explain the meaning of the following terms:—(*a*) molecule; (*b*) catalyst; (*c*) solution; (*d*) atom; (*e*) element.

12. Tabulate the following gases in order of their solubility in water—chlorine, oxygen, ammonia, hydrochloric acid, hydrogen.
To what extent would each of these gases be removed from solution by continued boiling?