1934

Inorganic Chemistry (2nd Year): Technical School Examinations 1934

Department of Education: Technical Instruction Branch

COURSES IN APPLIED CHEMISTRY.

AN ROINN OIDEACHAIS.
(Department of Education.)
BRAINSE AN CHEÁRD-OIDEACHAIS.
(Technical Instruction Branch.)

TECHNICAL SCHOOL EXAMINATIONS.
1934.

INORGANIC CHEMISTRY.
(Second Year.)

Monday, May 7th—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* questions only may be attempted.

(*e*) *In all cases definite chemical changes should be expressed by equations.*

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1. Explain the meaning of hardness as applied to water and give an account of the technical methods of water softening.

2. Describe a commercial method for the production of hydrogen peroxide solution.
How may the strength of such a solution be determined?

3. State Faraday's Laws of Electrolysis and explain by the ionic theory the changes taking place when a current is passed between (*a*) platinum electrodes in dilute sulphuric acid, (*b*) copper electrodes in copper sulphate solution, (*c*) silver electrodes in silver nitrate solution.

4. How is calcium carbide manufactured?

Give two applications of this substance in industry.

5. Describe the manufacture of calcium superphosphate. What advantages has superphosphate over ground raw phosphate as a fertilizer?

6. 50 c.c. of a decinormal solution of silver nitrate was added to 50 c.c. of a solution of hydrochloric acid. The excess of silver nitrate was then titrated with 1·1 decinormal potassium thiocyanate solution and required 25 c.c.

Find the weight of hydrogen chloride per litre of its solution. H = 1; Cl. = 35·5.

7. Describe the production of ammonia by the Haber process. Give a sketch of the plant.

8. What substances are normally present in atmospheric air? Give an account of the discovery of *one* of the "rare" gases of the atmosphere.

9. How would you detect the under-mentioned radicles by qualitative analysis? Give equations for the reactions employed.

(*a*) copper; (*b*) zinc; (*c*) ammonium; (*d*) thiosulphate; (*e*) iodide.

10. Describe the manufacture of bleaching powder. What is meant by the "available chlorine" in bleaching powder and how may it be estimated?

11. Give an account of the properties of the nitrogen group of elements with reference to their compounds with hydrogen, oxygen and chlorine.

12. Write a short essay on Gaseous Dissociation.