

UNIVERSITY OF LONDON

General Certificate of Education Examination

SUMMER 1972

ORDINARY LEVEL

Physics with Chemistry 2

Syllabus A

CHEMISTRY

One and a half hours**Answer FOUR questions. All questions carry equal marks.**

Any chemical reactions described should also be represented by equations wherever possible, and diagrams of apparatus should be given wherever they clarify an answer.

Candidates are reminded of the necessity for good English and orderly presentation in their answers.

1. Give an account of the manufacture of (a) sodium hydroxide, (b) sodium carbonate.

How, and under what conditions, does sodium hydroxide react with (i) carbon dioxide, (ii) ammonium chloride, (iii) copper sulphate?

2. Describe the preparation of dry hydrogen sulphide. State what happens when hydrogen sulphide is passed into solutions of (a) copper sulphate, (b) potassium permanganate, and (c) ferric chloride (iron(III) chloride).

What happens when hydrogen sulphide is burnt in a limited supply of air?

3. What is an oxide and how may oxides be classified? Classify the following oxides by discussing their characteristic properties:

Water	Sulphur dioxide
Calcium oxide	Copper oxide

4. What do you understand by the term *allotropy*?

Name the allotropes of carbon and state briefly the differences between them. How could it be proved that these are allotropes of carbon?

5. How would you demonstrate that ammonia contains both nitrogen and hydrogen?

How and under what conditions does ammonia react with (a) copper sulphate, (b) ferric sulphate (iron(III) sulphate), and (c) hydrogen chloride?

6. Describe and explain the changes in colour which take place when (a) ferrous sulphate (iron(II) sulphate) crystals are strongly heated in air to constant weight, (b) the solid residue is heated to constant weight in a stream of hydrogen.

What weights of solids would you expect to obtain in (a) and (b) if you started with 139 grammes of ferrous sulphate (iron(II) sulphate) crystals? (Fe = 56, S = 32, O = 16, H = 1). Assume the formula for the crystals to be $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$.

7. Give the names and formulae of the three common mineral acids found in the laboratory. Which one would you *not* use to prepare (a) hydrogen from a metal, and (b) carbon dioxide from marble? Give reasons for your answer.

State briefly how you would use *one* of these acids to prepare *each* of the other *two* from one of its sodium salts.

Give a confirmatory test for each of the three acids.
