

Name : _____ Signature : _____

Uganda Advanced Certificate of Education

S5 August 2025

End of Term 2

Chemistry Practical

Paper 2

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

This paper consists of two examination items, attempt both of them. Write your responses only in the spaces provided.

Use the first fifteen minutes to ensure that you have all the apparatus and fittings and reagents you will need.

Keep the script dry

A women's group has approached you for help with a sample of anhydrous sodium carbonate labelled **W**, they use in soap manufacture. The soap they got from this supply of sodium carbonate did not come out right. They think it may be impure – an impurity greater than 5% is not acceptable.

As a student of chemistry , design and carry out a scientific investigation to determine the percentage purity of **W** using about 2 g of **W** provided and GA2 which is a standardised 0.2M hydrochloric acid and methyl orange indicator.

Take atomic masses: C = 12; H = 1 and O = 16.

a) Report on your work below:

[illegible]

b) Advice the women's group accordingly.

Item 2

In a rural community in Gulu District, Uganda, a local agricultural cooperative has been using a white crystalline powder labeled "Substance Z" as a soil amendment to improve crop yields. The supplier claims that Substance Z is a mixture of a soluble calcium salt and a carbonate of another group 2A metal which would provide essential group 2A ions to address soil nutrient deficiencies. However, recent crop failures have raised doubts about the composition of Substance Z, prompting the cooperative to seek verification from the Uganda National Bureau of Standards (UNBS). As a chemistry student assisting the UNBS laboratory in Gulu, you have been tasked with analysing Substance Z to confirm the presence of the claimed cations. Your findings will help the

cooperative decide whether to continue using Substance Z or seek alternative suppliers to ensure soil fertility and community food security.

Task

Design and carry out a qualitative inorganic analysis of Substance Z to identify its constituent cations expected to be two cations. Use the reagents and apparatus provided by the UNBS laboratory, including sodium hydroxide (NaOH, 2 M), ammonia solution (NH₃, 2M), hydrochloric acid (HCl, 2 M), sulphuric acid (H₂SO₄, 1 M), ammonium chloride (NH₄Cl, 0.1 g per test), ammonium carbonate solution, potassium chromate(VI) solution. 8–10 test tubes, test tube rack, boiling tube, spatula, filter funnel, filter paper, petri dish, and droppers. Record your tests, observations, and deductions in a three-column table (Tests, Observations, Deductions), deduce the ions present, and provide a recommendation to the cooperative based on your findings.

[illegible]

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