

P525/2
CHEMISTRY
Paper 2
(Practical)
2026
3¼ hours



UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Advanced Certificate of Education

CHEMISTRY

Paper 2
(Practical)

3 hours 15 minutes

INSTRUCTIONS TO CANDIDATES

*This examination paper consists of two **compulsory** examination items.*

*Responses to these items **must** be written in the answer booklet provided.*

Begin each item on a fresh page.

All working must be clearly shown. Graph papers will be provided.

Mathematical tables and silent non-programmable scientific calculators may be used.

*You are **not** allowed to use reference books (i.e, text books, booklets on qualitative and quantitative analysis, etc.)*

1. Organic compounds have many applications such as being used as solvents in industries, preservation of food stuffs and biological tissues. A secondary school is organising a science exhibition where students will showcase various chemical products made using organic compounds among other substances.

When the organisers of the exhibition requested for samples, it was discovered that one of the containers did not bear a label. The organisers asked the students to use the content of the unlabelled container to determine the nature of organic compound as well as its likely application so that a label is printed before the exhibition. The students, however, did not know how this could be done and, hence, needed help.

You have been provided with liquid **Q** which is a sample of the unknown organic compound obtained from the unlabeled container.

Task:

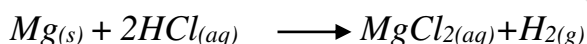
- a) Design and carry out systematic qualitative analysis investigation to generate information to be printed on the label.
(At least **8** tests are required).
- b) Make justifiable recommendations on the most likely applications of **Q**.

2. Magnesium oxide has a potential of being used as a binder during construction. The enthalpy of formation is a good measure of stability but it is not easy to determine directly. This however can be done indirectly using Hess's law.

Senior Five learners in a certain secondary school are exploring the use of locally made magnesium oxide as an alternative to Portland cement. They want to begin by determining its stability in the environment, before being used in construction but they do not know how it can be done.

The laboratory technician, when approached by the learners, advised them to react approximately 1.2 g of magnesium metal and 2.0 g of magnesium oxide separately with not less than 60 cm³ of dilute hydrochloric acid, measuring temperature after specific time intervals. However, with all this information, the learners could not determine the stability of magnesium oxide in the environment and therefore need your help.

The laboratory technician also gave them the following information. Both magnesium metal and magnesium oxide react with hydrochloric acid separately according to the following equations;



The heat of formation of water is represented by the equation.



The technician further provided that;

Specific heat capacity of water is 4.2 Jg⁻¹mol⁻¹.

Density of water is 1 gcm⁻³.

Average heat of formation of portland cement is -3000 kJmol⁻¹.

(Mg =24, O=16)

You are provided with the following;

- I. **Solid X**, which is magnesium metal.
- II. **Solid Y**, which is magnesium oxide.
- III. **FA1**, which is **2.0 M** hydrochloric acid.

Task:

Design and carry out an investigation then use your findings to help the senior Five learners. (Your response should be in form of a scientific report. A minimum of **six** readings are required).