

G621: Analysis at Work – Sample Assignment D

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| Unit Name: Analysis at Work | Unit Number: G621 |
| Assignment Title: A Preservative for Mummies | Assignment: G621 Sample Assignment D |
| Date Set: | Due Date: |
| Assessment Objective(s): AO3 | |

Vocational Brief:

Have you ever wondered how Egyptian mummies have lasted for thousands of years? When a person died, their organs were removed and the body treated with a number of naturally occurring preservatives before the body was wrapped. One of the preservatives used was an inorganic solid obtained from dried up lake beds.

You have been provided with an impure sample of this preservative, which has been called **mummion**, and you are required to analyse it.

Task:

The aim of this task is to safely complete the purification and analysis of mummion and to produce a report.

- identify hazards and carry out a risk assessment
- using the Purification and Qualitative Analysis of Mummion Practical Instructions, follow the procedures to purify the mummion
- devise and carry out a simple plan to identify the unknown anions and cation in the sample of mummion.

Produce a report that shows:

- an introduction to your analysis - to include some research that shows the vocational context
- the risk assessment you have used
- a record of your plan, practical guidance and observations
- a conclusion that interprets your results and states the chemical content of mummion, supporting your work with appropriate equations
- an evaluation of your plan and results.

[Max marks possible for this task: 7]

Resources:

- Class notes on qualitative inorganic analysis and relevant paper and electronic based material.
- *Practical Instructions: The Purification and Qualitative Analysis of Mummion.*

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Practical Instructions

The Purification and Qualitative Analysis of Mummion

Practical Instructions

Purification

Complete an appropriate risk assessment before starting your work.

You should assume that you are carrying out the qualitative tests for anions and cations as described in this unit.

1. Mummion is a white solid that is soluble in water. Your sample is contaminated with sand and iron(III) oxide, both of which do not dissolve in water.
2. Weigh out around 5 g of your impure sample of mummion. The mass need not be accurately known.
3. Add your entire weighed sample to 100 cm³ of distilled water in a conical flask.
4. Stir to dissolve the mummion, leaving the sand and iron(III) oxide as insoluble solids.
5. Filter the mixture to remove the insoluble impurities.
6. Boil the filtrate, which is a colourless solution of mummion, in an evaporating basin until only about 15 cm³ remain. The solution may spit on boiling and you should take adequate precautions.
7. Allow the solution to cool, when white crystals of mummion remain in the basin.
8. Remove the crystals from the liquid by filtration and dry them on a filter paper in air.

Devise a plan

Mummion is a mixture of two compounds. These two compounds have the same cation but two different anions.

1. Devise a simple plan showing the order in which you will test for the anions and cation present.
2. Analyse your crystals for the cation present using the tests that are in the specification and that you have practised in the laboratory.
3. Analyse your crystals for the anions present using the tests that are in the specification and that you have practised in the laboratory.

G621: Analysis at Work – Sample Assignment D Technicians' Guidance

The Purification and Qualitative Analysis of Mummion

Technicians' Guidance:

Suggested composition of mummion:

NaCl 20 g + Na₂CO₃ 10 g + 5g fine sand + Fe₂O₃ (a pinch)

(N.B. white washed sand is preferable)

The composition does not actually matter – however, sufficient Na₂CO₃ is needed to give enough CO₂ to affect the limewater.

Take care with the iron(III) oxide only a pinch, just to colour the mixture! If too much Fe₂O₃ is added, as it is very fine it goes through the filter paper (could omit if problematic). If Fe₂O₃ is used make sure it is coarse enough to be retained by the filter paper.