G629: Synthesising Organic Chemicals – Sample Assignment C1

Unit Name: Synthesising Organic Chemicals	**Unit Number:** G629
Assignment Title: The Preparation of the Antiseptic Triiodomethane	**Assignment Number:** G629 Sample Assignment C1
Date Set:	**Due Date:**
Assessment Objective(s): AO3	

Assignment Brief:

Drugs and medicines form an important part of organic synthesis. Research chemists are working all the time to develop chemical compounds that will help to improve health and hygiene.

In this assignment you will use a range of practical techniques to prepare a pure sample of triiodomethane (commonly called iodoform) and record the outcomes of your work.

The compound iodoform (CHI_3) is a yellow, crystalline, volatile substance. It has a penetrating odour (the smell is sometimes referred to as the smell of hospitals) and a sweetish taste, and is analogous to chloroform $CHCl_3$. It was used in medicine as a healing and antiseptic dressing for wounds and sores around the beginning of the 20th century, though this use is now superseded by better antiseptics.

Iodoform can be synthesized by the reaction of iodine and sodium hydroxide with any one of these four kinds of organics:

- a methyl ketone: CH_3CRO, where R is an organic side chain
- ethanal: CH_3CHO
- ethanol: CH_3CH_2OH
- secondary alcohols: CH_3CHROH, where R is an alkyl or aryl group.

The melting point of the compound is 119 ^{o}C, and it is insoluble in water but soluble in ethanol.

(From: http://www.mywiseowl.com/articles/iodoform)

Task:

The aim of this task is to safely prepare and purify triiodomethane. You should:

- check you have the instructions for your preparations
- identify hazards and carry out a risk assessment
- carefully follow the set procedures
- record any observations and measurements
- process and evaluate results.

(2 practicals need to be completed for AO3 – the total mark allocation = 26. Each practical can either be marked /13 or /26 (and then divided by 2)).

[Max marks possible for this task: 13]

For AO3(a)

You do not need to rewrite the practical instructions, but ensure that you:

- complete full and workable risk assessments
- include a copy of the instructions you use
- check that your supervisor has records of how confidently you complete the work.

For MB2 and MB3

- record evidence of individual planning
- justify why you have used the techniques in your practical work
- show evidence that you have used COSHH data.

For AO3(b)

Your report should include:

- illustrations/diagrams clearly showing the procedures
- information on the observations and measurements of each stage of your practical.

For MB2 and MB3

- check your accuracy and level of precision
- present your information clearly and logically.

For AO3(c)

- record, process and suitably present all your data (results, yields, etc.)
- check that your work is clearly presented and easy to follow.

For MB2 and MB3

- include accurate equations
- check that there are no mistakes and recordings are to the correct significant figures
- check that all work is logical.

For AO3(d)

- draw a conclusion with information on the final yield
- complete a full evaluation of all the stages of your practical work.

For MB2 and MB3

- explain the % yield and make suitable suggestions for its improvement
- include alternative techniques with reasons.

Note

In addition, you can gain AO2(c) if you complete:

- calculations showing actual and theoretical yields
- work in % yields
- calculations and researched data on costs of producing one of your chosen chemicals.

For MB2 and MB3

- show evidence of independent work.

[Max marks possible for this task: 4]

Resources:

Class notes on practical organic chemistry and relevant paper and electronic-based material.