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0750-732031
WhatsApp

CHEMISTRY

Paper 1

January, 2024

2 $\frac{1}{2}$ hours.

New Lower Secondary Curriculum Assessment

S.4 TRIAL TEST ONE 2024

CHEMISTRY

Paper 1

2 hours 30minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists of two sections A and B.

SECTION A: Consists of two **broken** scenario-based tasks. Responses to items in section A should be written in the spaces provided.

SECTION B: Consists of two **unbroken** scenario-based tasks. Responses to the items **must** be written in the response booklet provided.

Attempt **all** items in this paper.

FOR ASSESSMENT USE ONLY				
Scores of Basis of assessment.	A	B	C	D
ITEM 1.				
ITEM 2.				
ITEM 3.				
ITEM 4.				

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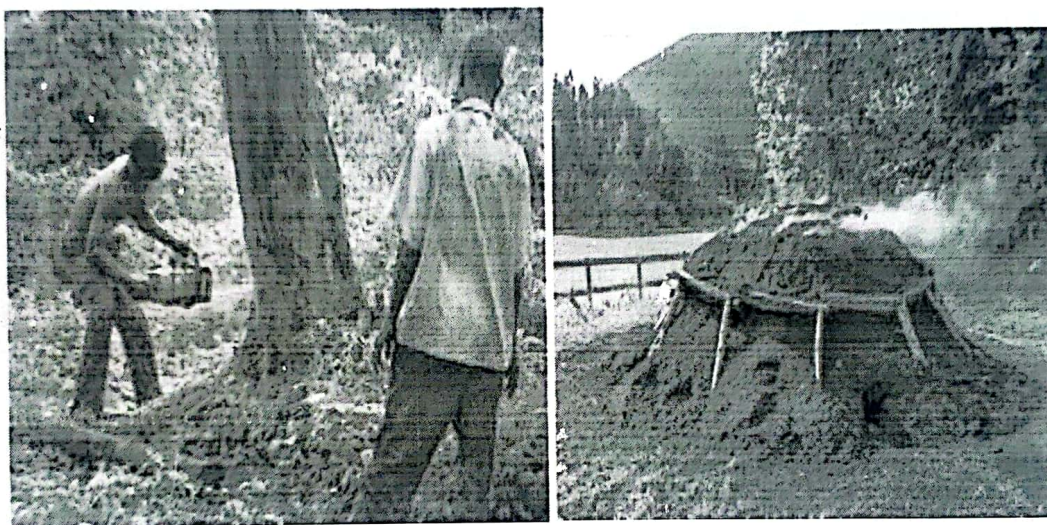
Page 1 of 7

SECTION A

Attempt all items in this section.

1. Most of the youths in ADUK village in eastern Uganda are involved in cutting trees, burning the wood and the final products for cooking.

Residents are frustrated with toxic fumes from the activities. They are curious and beseech to know the nature and composition of the product and why the activities.



The chairperson has contacted you as a chemistry student for guidance on what she is about to communicate in the community meeting.

Tasks;

(a) Guide the chairperson on

(i) nature of the product

Non renewable fuel; because it takes long to replenish.

An example; Wood charcoal.

$T/S = 03$

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Identify of the Category with reason and example = 03

Identify of the Category and reason / Identify with example = 02

Identify only = 01
or example only

No identify, No example = 00
(Wrong identify)

(ii) composition of the product

Wood charcoal is made up of Carbon.

Any two components = 02

Any one component = 01

Wrong/No component = 00

$T/S = 02$

(b) Her concern is "can these ^{products} activities have any impact to their community?" if so can this impact be reduced? Advise her

- Global warming hence climate change as a result of high levels of Carbon dioxide produced from combustion of wood charcoal in excess air. This can be mitigated by; - Use of renewable fuels - Reduced combustions.

$T/S = 03$

- Suffocation and death of animals due to toxic fumes (Incomplete combustion leading to Carbon monoxide) that are poisonous to ~~man~~ animals.

Any impact, how it occurs and its mitigation = 03

Any one impact, how it occurs but no mitigation = 02

Any one impact OR Mitigation OR How it occurs = 01

(Wrong Impact)

No impact, how it occurs = 00

(c) "Can the product benefit the residents?" Take her through

- Wood charcoal is used in gas masks to absorb toxic gases
- Wood charcoal is used as a fuel for cooking
- Used as a drug

$T/S = 01$

One benefit of the natural resource = 01

NO benefit of the natural resource = 00
(Wrong benefit)

2. A new knitting firm in Entebbe Uganda makes sweaters from cotton. However, clients are complaining that these are easily decomposed by moths and carpet beetles.

The operations manager has heard of nylon as an alternative material. She is uncertain of its nature, composition and effect on the natural well-being of the community.



She has contacted you as someone with knowledge of chemistry to guide her in making a better choice.

Tasks;

(a) Guide the manager on

(i) the category of the selected alternative material

Synthetic fibre; because it is made by man.

Example; Nylon.

T/S = 03

Identified Category with a reason and example = 03

Identified Category with either a reason or example = 02

Identified Category OR Example OR Reason = 01

No Category, No reason, No example = 00

(ii) the characteristics of the material

$$T/S = 03$$

Nylon is more resistance to heat than cotton.

Nylon is ^{more} long lasting than cotton

Nylon has a higher strength and toughness than Cotton

Nylon can be reproduced easily in big quantities

At least 4 properties = 03

At least 2 properties = 02

At least 1 property = 01

No property / wrong property = 00

(b) He is inquisitive about its use. Advise her

$$T/S = 01$$

Used for making fabrics / clothes.

Used for making ropes.

Scor

For any one ^{correct} use = 01

Wrong / No ^{correct} use given = 00

(c) "Will the selected alternative have an effect on natural well-being of the community?" If YES, What can be done?

Nylon pollutes the environment since it is non-biodegradable. Mitigation: - Recycling of Nylon
- Re-use

Pollution can be mitigated through - Reduce its usage

$$T/S = 02$$

R3

Identified impact and mitigation = 02

Identified impact OR Mitigation = 01

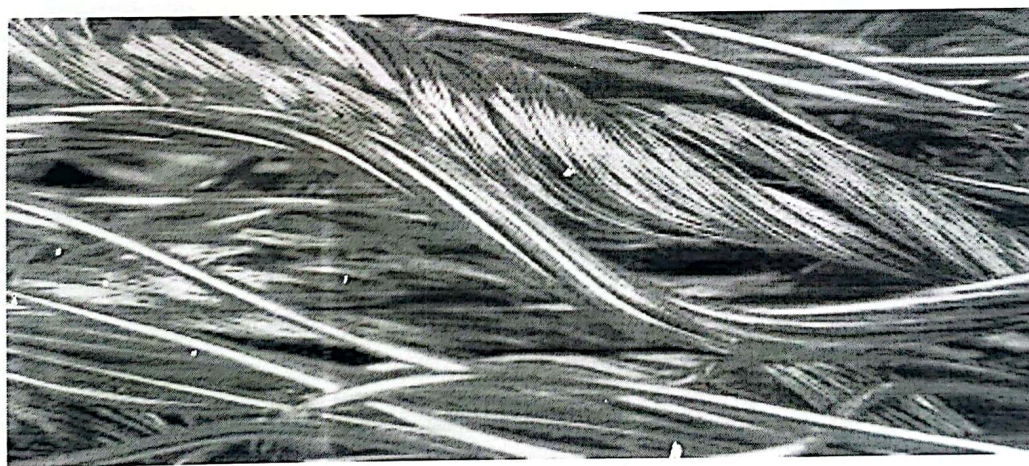
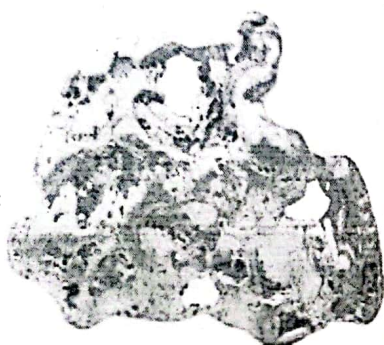
No Identified impact, No mitigation = 00
(wrong impact)

SECTION B

Attempt all items in this section.

3. Uganda electrical engineers' forum has raised a concern of reduced copper wires in the country.

In response, the government has contracted an investor to set up a new copper extraction plant in Kasese, a copper ore rich district.



Unfortunately the investor has some doubts on his scientific knowledge on the production process and the likely impact on the environment.

Task;

As a chemistry student, write a message to the investor to settle his doubts before his final interaction with residents.

ITEM 3.

ADVICE TO THE INVESTOR ON THE NEW COPPER EXTRACTION PLANT.

Raw materials; one (Copper pyrites)

Silicon(IV) oxide Silicon dioxide.

$T/S = 02$

All raw materials = 02
Any one Raw material = 01
Wrong / No raw material = 00

Process of Production;

The Copper pyrites are first concentrated by froth flotation. ^{in a container}
The concentrated dried ore is then roasted in air to obtain iron(II) oxide
& copper(I) sulphide and sulphur dioxide gas.

The iron(II) oxide impurity is removed by heating the roasted product above with Silicon dioxide in a blast furnace in absence of air and molten slag tapped off. (CP)

The Copper(I) sulphide is heated in controlled amount of air to form impure copper. (Cd)

Impure copper is purified by electrolysis using impure copper as anode and pure copper as Cathode using acidified copper(II) sulphate solution as an electrolyte. (Pr)

Process with all $V, CP, Cd, Ch, Pr = 03$

$T/S = 03$

Process with any 3 = 02

Process with any 1 = 01

No process / wrong process = 00

Side effects

- Toxic fumes from the process of production can lead to suffocation and death
- Sulphur dioxide produced as a by product can react with water vapour in atmosphere forming acidic rains that affect walls of houses

Mitigation $02 =$ one danger, explained and mitigated
 $01 =$ one danger explain, No mitigation
 $00 =$ No danger given

- Create a Sulphuric acid manufacturing plant nearby to use the sulphur dioxide. $(T/S = 02)$
- Proper control of waste gases.

Social benefits

- The plant will provide employment opportunities to residents. Residents will get salaries and hence improving their standards of living. $T/S = 03$
- Government revenue will increase from taxes imposed on the plant hence improved infrastructures such as roads in the community.

one benefit, effect of benefit and impact of benefit = 03
one benefit, effect of benefit
one effect of benefit and impact = 02
one benefit or one effect = 01

(wrong)
No benefit / impact / effect = 00

4. The ladies in Otunu women's group in Mbarara district have given up on using soap in their homesteads due to its price fluctuation in the region.

The chairperson of the group has a suggestion of processing liquid soap as an alternative since it's cheaper.



However she has some doubts whether it's a better choice and its impact to their ecosystem.

Task;

She has approached you as a chemistry student settle her doubts. Write a message to guide her in her presentation in the forthcoming group meeting.

END.

ITEM 4.

ADVICE TO THE CHAIRPERSON.

Type of product; Soapless detergent
Example Liquid soap.

$T/S = 02$

No product, one type
one product and type = 02
one product, No type = 01
No product, No type = 00

Function of the product; Used as a cleansing agent for washing and cleaning surfaces.
One function = 01
No function = 00

$T/S = 01$

Side effects

Mitigation.

- Pollutes the environment since it is non-biodegradable
- Contain phosphates which are nutrients for algae, thus promoting algae growth. In the process, oxygen supply is cut off leading to suffocation and death of aquatic life.

- Minimize its disposal to the environment

$T/S = 03$

One danger/side effect explained and mitigated = 03
One danger, explained Not mitigated = 02
One danger not explained but mitigated = 01
One danger explained = 01
No danger identified = 00.

Evaluation of the product

Similarities; Both are cleansing agents.

Differences.

Liquid soap (soapy detergent) | Soap (soapy detergent)

$T/S = 02$

- | | |
|--|--|
| - Does not form scum with hard water | - Forms scum with hard water. |
| - Expensive to manufacture | - Cheaper to manufacture |
| - Produced from Sulphuric acid and an alcohol or benzene | - Produced from Sodium hydroxide and oil/fats. |

One similarity one difference = 02
One similarity, No difference = 01
~~One~~ No similarity, One difference = 01
No similarity, No difference = 00