

Candidate's Name:

Stream:

545/1
CHEMISTRY
Paper 1

BEGINNING OF TERM II EXAMINATIONS 2024

New Lower Secondary Curriculum

S.3 CHEMISTRY

1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES:

Attempt all the items in this paper.

Use the following where applicable

(N = 14, H = 1, S = 32, O = 16, C = 12)

ITEM 1

A team of scientists found a strange substance in form of a foil, calling it element X. Subsequently, they successfully determined its atomic number and mass number but couldn't place it in the periodic table. This is because there was no full discussion from other scientists yet on what X does and how it affects the environment. It was discovered that the atomic number and mass number of X are 13 and 27 respectively.



You are required to contribute and help in placing X in the periodic table.

Task:

(a) Identify the category of the element X (03 scores)

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(b) Predict the properties of element X (04 scores)

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(c) Predict the possible uses of element X (03 scores)

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(d) Is element X environmentally friendly? If not advice the scientists on how to handle X. (03 scores)

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ITEM 2

Shell, a leading petroleum (oil and gas) company has been selling gas for a number of years. However customers have recently started complaining about shell gas. They claim that the gas is not clean and it produces a lot of soot as cooking is going on. The sales manager affirms that shell gas is composed of propane and butane, gases that burn in air without forming soot. This has forced shell to open up an inquiry into the matter and the shell gas of complaining customers was tested. The industrial chemists at the shell factory discovered that the percentage of carbon in this gas was 85.71% and that of hydrogen was 14.29%. These results mean that the sample of shell gas tested did not contain propane or butane or their mixture. Instead another gas of unknown identity was detected and this gas was named P. The relative molecular mass of gas P was found to be 42. These results were forwarded to the sales manager who seeks your assistance in understanding them. [C = 12, H = 1]



Task

As a chemistry student, guide the sales manager on;

(a) The category of gas P.

(7 scores)

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(b) The behaviour of gas P. (3 scores)

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(c) Why the gas P produces more soot than propane or butane when burnt. Show your working. (3 scores)

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(d) The impact of gas P on the environment and how this can be limited. (3 scores)

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ITEM 3

Natural resources have been destroyed as a result of increasing population and human activities. This has attracted the attention of the officials from the National Environment Management Authority (NEMA).



The officials are planning to create awareness to the people of the country through sensitization workshops organized in different district communities.

Task:

As a chemistry student, prepare a short presentation you will deliver during the workshop upon invitation.

END