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ST. MARY'S COLLEGE RUSHOROZA

Uganda Certificate of Education

S.2 chemistry

Paper one

2 hours

Instructions to students.

- ✓ *This paper consists of two sections A and B*
- ✓ *Attempt **all** items in this paper.*
- ✓ *Unnecessary cancelling poor handwriting and abbreviating will lead to loss of scores*

SECTION A

Item one

Most people living in villages of Kigezi use white iron sheets to roof their houses. However these iron sheets are not long lasting. The brown coating is seen covering the iron sheets with time and they later develop holes. As a result, they are spending much money to replace the iron sheets after 5-7 years.

Tasks. As a chemistry learner;

(a) Point out the chemical name and formula of the brown coating

(i) Chemical name

(1 scores)

(ii) Chemical formula

(1 score)

(b) Help people of Kigezi to understand the mechanism for the formation of
other brown coating.

(3 scores)

(c) Advise the people of Kigezi how they can overcome the challenge.

(3 scores)

(d) The above condition can affect even other materials like knives, hoes.

How does it affect the quality of these materials? (1 scores)

Item two.

Argon, oxygen and nitrogen are obtained from air by fractional distillation of liquid air at -250°C where air is warmed up and the gases are collected one by one.

Tasks. As a chemistry learner;

(a) State whether liquid air is a mixture or a pure substance. (2 scores)

(b) Explain why fractional distillation is used instead of simple distillation to separate components of air. (2 scores)

(c) During the distillation, nitrogen is obtained first the argon and oxygen.

Explain this phenomenon.

(3 scores)

(d) Name the gases that are not collected through the fractionating column during the above process.

(2 scores)

SECTION B

Item three

People living around Kitumba industrial area have constantly been complaining of stomach pains, flu among others. On visiting the hospitals, they are diagnosed of diseases like cholera, diarrhea, typhoid, malaria and so on. On close observation of the water they use for domestic purposes, the color has changed, it smells and the algae have started growing on the surface of water.

The chairperson has called a community meeting in the area to talk about the challenges faced and probably what can be done to overcome them. You have been contacted to address the community.

Task .As a chemistry learner; explain the source of their suffering and the possible solutions. (11scores)

Item four

Below is an article extracted from the new vision of 07th/May/2022. Read the article carefully and answer the items that follow. Top story “air pollution killing more than AIDS” – New Vision official. Gerald Tenywa. Journalist @ New Vision. Every home in Uganda has either been infected are affected by HIV and AIDS. They have either lost a relative or have suffered as a loss of a bread winner. Air pollution has gone two steps ahead of HIV in affecting Ugandans as it has claimed more lives than HIV, Daniel Okello , director in charge of environment at kampala capital city authority(KCCA) ,has said. “We lost 23000 people in 2019 due to HIV in Uganda. In the same period, 26000 people died as a result of cardiovascular diseases linked with air pollution, “he said. Okello was speaking during the launch of the air quality awareness at Uganda media center in Kampala on 04th/May/2022.The event, themed “be aware, be prepared”, attracted top officials from National Environment Management Authority (NEMA), Makerere University and Ministry of Health, who called for increased awareness and actions to curb air pollution . Okello mentioned two types of air pollution-outdoor air pollution and household or indoor air pollution which are all greatest environmental threat to human health around country pointing out Kampala, Mukono and Jinja with the poorest air quality which is five times away above the critical threshold of the world health organization. Okello said indoor air pollution

results from cooking with biomass fuels particularly charcoal, firewood, burning of organic fuels such as kerosene, burning of bushes and other waste products like plastics. Partial combustion of these fuels lead to emission of carbon monoxide gas which is poisonous if inhaled. Worse than indoor pollution, he added, is outdoor air pollution that results from old cars spewing fumes. As the cars burn fuels, such as diesel and petrol to power engines, they release poisonous gases such as carbon monoxide and also lead from motor vehicle emissions, dust from unpaved roads and construction sites, factories release fumes filled with sulphur dioxide gas which leads to acid rains and carbon monoxide gas which is poisonous. Burning of wastes including plastics, produce dioxins and furans which cause cancer.

Dr Ivan Kimuli from Makerere University's lung institute said they have done studies that indicate that 11% of the pollution suffers from asthma and that being aggravated by poor air quality and the same study indicated that children in rural settings had "better and less damaged lungs" than those in urban settings, who were exposed to pollutants in the air. NEMA's director for the environment monitoring and compliance, Waswa Ayazika, said: "the government is currently making a clear plan to improve air quality involving everybody's responsibility to save the current and future generation."



Tasks.

- (a) State what is meant by the term air pollution (1 score)
- (b) From the article, state the types of air pollution and outline how each type of air pollution is caused. (6 scores)
- (c) Suggest any four solutions that can be adopted into the government strategic plan of how air pollution in the country can be greatly reduced. (4 scores)

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CHEMISTRY DEPARTMENT SMACO RUSH