

بِسْمِ تَعَالَى

تحية من القلب الى فلذات الاكباد... تلامذتنا الاحبة... سنبقى معا ننهل العلم لنواجه

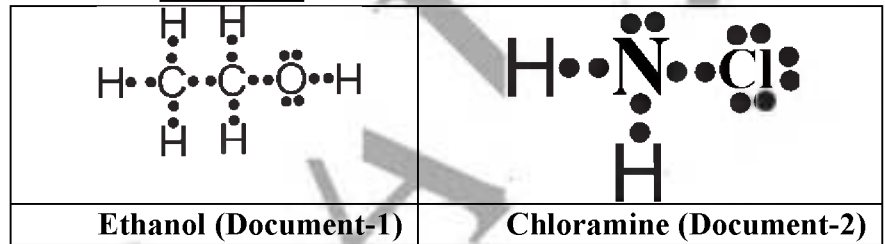
التحديات وليكن شعارنا : " سنهزم الخوف... سنهزم الكورونا وننتصر "

Exercise 1 Antiseptics and Disinfectants

Antiseptics and disinfectants are substances intended to kill germs locally outside the body. They are used in veterinary environment, to prevent and treat local infections.

Ethanol (C₂H₆O) is an antiseptic. Chloramines (NH₂Cl) are an inexpensive treatment option, but they are not a "primary" disinfection treatment.

The Lewis structure for each molecule of ethanol and chloramine are :



1. By referring to the **Document-1**.

- 1.1. Indicate the valency of the atom of hydrogen.
- 1.2. Give the Lewis representation an oxygen atom.
- 1.3. Identify the type of bond between the carbon atoms in ethanol.

2. By referring to the **document-2**:

- 2.1. Explain how the nitrogen atom (N) obeys its octet in the molecule of chloramine.
 - 2.2. Specify to which column (group) of the periodic table chlorine belongs.
3. Hydrogen peroxide (H₂O₂) has antiseptic properties. The equation of the H₂O₂ decomposition reaction is:
- $$2 \text{H}_2\text{O}_2 \rightarrow \text{O}_2 + 2\text{H}_2\text{O}$$
- 3.1. Give the representation of the molecule H₂O₂.
 - 3.2. Show based on the change in oxidation numbers that this reaction is redox.
4. By referring to the text:
- 4.1. The definition and importance of antiseptics and disinfectants.
 - 4.2. An antiseptic and a disinfectant.

Exercise 2 Metallic zinc (Zn) in galvanic cells

A galvanic cell is an electrochemical generator constituted of two half-cells connected together by a salt bridge. Zinc is a metal of blue-gray color, moderately reactive, used usually as an electrode in many galvanic cells. Fatima, a grade nine student supposes that metallic zinc (Zn) must play the role of the anode in all galvanic cells. In order to test her hypothesis she performs the following experiments.

1. Pick up from the text the hypothesis formulated by Fatima.

2. **Document-1** represents the schematic representation of galvanic cell (**G₁**) when functioning.

2.1. Show that the zinc strip (Zn) is the anode of the cell (**G₁**).

2.2. We propose the three statements.

If the statement is true, justify it. If the statement is wrong, specify the correct answer.

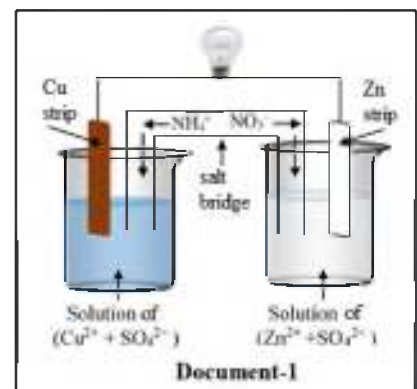
a) The mass of the zinc strip after functioning is greater of that before functioning.

b) Electrons move from the zinc strip to the copper strip.

c) The half-electronic equation at the anode is: $\text{Cu} \rightarrow \text{Cu}^{2+} + 2\text{e}^-$.

2.3. Calculate the number of oxidation of nitrogen element in the ion NH₄⁺.

3. During a lab session, we build a galvanic cell (**G₂**), whose symbolic representation is:



Al| Al³⁺ - salt bridge - Zn²⁺| Zn

- 3.1. The metal Al is the anode in this cell (**G₂**). Justify.
- 3.2. Write the half-electronic equation at the anode of cell (**G₂**).
- 3.3. Deduce the overall equation of the reaction in the cell (**G₂**), knowing that the half-electronic equation at the cathode of this cell is: $\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn}$.
4. Is the hypotheses of Fatima validated? Justify.
5. Classify the metals Al, Cu and Zn on an axis according to the order of their tendency to lose electrons.

Exercise 3

Organic and inorganic compounds

The principle difference between organic and inorganic compounds is the presence of the carbon atom. The organic compounds contain one or more carbon atoms while the inorganic compounds donot with some exceptions as: carbon dioxide (CO₂).

Document-1 shows the formulas of some compounds.

(A) CH₃Cl, (B) C₂H₆, (C) NaCl, (D) C₂H₅OH, (E) C₃H₄, (F) C₂H₄, (G) CO₂, (H) Cl₂

Document-1

1. Recopy the table below and classify the given compounds into compounds (hydrocarbons or non hydrocarbons) and inorganic compounds.

Organic Compounds		Inorganic Compounds
Hydrocarbons	Non hydrocarbons	

2. Consider the compound (**E**) of molecular formula C₃H₄.

2.1. Identify the family (alkane, alkene or alkyne) of this compound.

2.2. Write its condensed formula and give its IUPAC name.

3. Chloromethane (**A**) can be obtained by the substitution reaction of methane where a molecule of methane (CH₄) and a molecule of chlorine (Cl₂) react under sunlight to give one molecule of hydrogen chloride (HCl) and one molecule of chloromethane.

- Translate, using molecular formulas, the above information into a chemical equation.

4. **Document-2** represents the electron configuration of the atoms: Na and Cl.

4.1. Determine the atomic number the sodium element (Na).

4.2. Explain the bond formation of the compound (C) NaCl.

${}_{z}\text{Na} : \text{K}^2 \text{L}^8 \text{M}^1$ and ${}_{17}\text{Cl} : \text{K}^2 \text{L}^8 \text{M}^7$

Document-2