



**UNITED NATIONS SCHOOL I.E.D.
PEI: COMPREHENSIVE TRAINING OF COMPETENT ENTREPRENEURIAL LEADERS, WITH
DEMOCRATIC, TECHNOLOGICAL, CULTURAL AND SPORTS PRINCIPLES
MOTTO: "EDUCATION, SCIENCE, CULTURE AND SPORT TO TRANSCEND"**

**PREPARATION WORKSHOP FOR THE FIRST PERIOD
CHEMISTRY
EIGHTH GRADE
TEACHER HEISEL QUESADA**

The preparation workshop must be carried out in the Chemistry notebook as a requirement to take the competency test

Delivery date: April 1

Oxidation numbers are a fundamental tool in chemistry for understanding how atoms gain, lose, or share electrons during a chemical reaction. These numbers represent the electric charge that an atom acquires when it forms a compound, assuming that the electrons in a bond are completely mapped to the most electronegative atom.

In an ionic compound, oxidation numbers are relatively easy to determine. For example, in sodium chloride (NaCl), sodium has an oxidation number of +1 due to losing an electron, while chlorine has an oxidation number of -1 due to gaining an electron. In covalent compounds, oxidation numbers can be more complicated to determine and are often based on the relative electronegativity of the atoms involved.

Oxidation numbers play a crucial role in the stoichiometry of chemical reactions, as they allow chemical equations to be balanced by ensuring that the amount of electrical charge in the reactants is equal to the amount of charge in the products. In addition, oxidation numbers influence the reactivity of elements, as those with higher oxidation numbers tend to be more reactive due to their greater tendency to gain electrons, while those with lower oxidation numbers tend to be less reactive due to their lower tendency to lose electrons.

In summary, oxidation numbers are a crucial tool in chemistry that allows us to understand how atoms interact with each other in chemical reactions, influencing bond formation, element reactivity, and reaction stoichiometry.

1. What is the role of oxidation numbers in the stoichiometry of chemical reactions according to the reading?
2. How do oxidation numbers influence chemical bond formation?
3. What is the relationship between oxidation numbers and the reactivity of elements in a chemical reaction?
4. Based on the information given, he makes a proposal to calculate the oxidation numbers and structural formulas for 10 compounds different from those seen in class
5. What is the importance of understanding oxidation numbers in the formation of chemical bonds, and how could this knowledge be used to predict the stability of different compounds under specific conditions?

One of the most obvious applications of oxidation numbers is in the realm of electronics and technology. For example, in rechargeable lithium-ion batteries, oxidation numbers are crucial to understanding how electron transfer takes place between the positive and negative electrodes during charging and discharging. This understanding is essential for developing more efficient and long-lasting batteries, which has a direct impact on devices such as mobile phones, laptops, and electric vehicles.

In medicine, oxidation numbers are used in the field of clinical chemistry to analyze biological samples and diagnose diseases. For example, in the blood glucose test, reagents are used that react with the sugar present in the sample, changing its oxidation number. By measuring this change, healthcare professionals can accurately

determine a patient's blood glucose levels, which is critical for the management of diabetes and other medical conditions.

In the food industry, oxidation numbers are used in food preservation. For example, antioxidants are common additives that are added to foods to prevent the oxidation of fats and oils, helping to extend their shelf life and maintain their nutritional and sensory quality. These antioxidants work by changing the oxidation number of the molecules involved in oxidation reactions, thus preventing unwanted changes from occurring in the final product.

In short, oxidation numbers are a powerful and versatile tool that is used in a wide range of applications in our everyday lives, from technology to medicine to the food industry. Their understanding and application allow us to develop more efficient, safe and sustainable products and processes, thus improving our quality of life.

6. How could advances in the understanding and application of oxidation numbers in the food industry contribute to the improvement of the quality and safety of food products in today's market?
7. How could oxidation numbers be used to develop innovative solutions in food preservation that address the current challenges of global food production and distribution?
8. How could understanding oxidation numbers in battery technology influence the development of more efficient and sustainable electronic devices?
9. How might advances in the use of oxidation numbers in clinical chemistry improve methods of diagnosing and treating disease?
10. What role could oxidation numbers play in the development of more sustainable and environmentally friendly technologies in various industries?