

DAYSTAR SECONDARY SCHOOL, WAKISO.

SENIOR THREE PROJECT WORK

CHEMISTRY.

SOAP MAKING

Project Title: Exploring Soap Making with Beef Tallow (fat) and Lye (Sodium hydroxide)

Project Objective: The objective of this project is to provide students with hands-on experience in soap making using beef tallow and lye. Additionally, the project aims to teach students the process of treating the soap so that it can be used safely and effectively

Duration: 3 weeks

Project Overview

1. Introduction to Soap Making

- ❖ Provide an overview of soap making, including the history and basic chemistry involved
- ❖ Explain the different types of fats or oils used in soap making and their properties
- ❖ Discuss the benefits and properties of using beef tallow as a soap ingredient

2. Safety Precautions

- ❖ Educate students about the importance of safety when working with lye(sodium hydroxide) and other chemicals
- ❖ Explain the proper handling and storage of lye and other soap-making ingredients.
- ❖ Demonstrate the use of personal protective equipment (PPE) such as gloves and goggles

3. Soap Recipe Development

- ❖ Guide students in developing a soap recipe using beef tallow and lye, taking into consideration the desired properties and fragrance
- ❖ Discuss the importance of accurately measuring ingredients and understanding the concept of saponification

4. Soap Making Process

- ❖ Step-by-step demonstration of the soap making process, including
- ❖ Measuring and mixing the beef tallow and lye solution.
- ❖ Explaining the concept of trace (the point at which the soap mixture thickens).
- ❖ Pouring the soap mixture into molds
- ❖ Allowing the soap to cure and harden

5. Soap Treatment and Curing

- ❖ Explain the significance of soap curing and the chemical changes that occur during this process.
- ❖ Demonstrate proper curing techniques such as air drying and using a curing rack.
- ❖ Discuss the ideal curing conditions (e.g., temperature, humidity) for obtaining high-quality soap.

6. Testing and Evaluation

- ❖ After the initial curing period of three weeks, instruct students to test the soap for usability and quality
- ❖ Guide them in evaluating the soap's lather, cleansing ability, fragrance, and overall performance
- ❖ Encourage students to document their observations and compare the results with commercially available soaps

7. Presentation and Reflection

- ❖ Ask students to create a presentation showcasing their soap making journey, including the recipe, process, and results in a well written **REPORT**
- ❖ Facilitate a group discussion for students to share their experiences, challenges, and newfound knowledge
- ❖ Encourage students to reflect on the importance of sustainable soap making and its potential impact on personal and environmental well-being

8. Additional Considerations

- ❖ Provide resources and references for further reading and research.
- ❖ Encourage creativity in soap design
- ❖ Discuss the potential for soap making as a small business or entrepreneurial opportunity
- ❖ Emphasize the importance of continuous learning and improvement in soap making techniques

NOTE:

- Throughout the project, emphasize the significance of sustainability, eco-friendly practices, and responsible sourcing of ingredients
- Remember, it's crucial to ensure appropriate supervision and adherence to safety guidelines when conducting this project

References that can be used during the project

<https://www.youtube.com> to watch soap making videos

<https://www.soapcalc.com> to be helped on making the recipe and knowing different saponification values (SAP Value)

FORMULAE, STOICHIOMETRY AND MOLE CONCEPT

Project: Title: Exploring Stoichiometry and Mole Concept in Chemistry

Project Objective: The objective of this project is to introduce students to the concepts of formulae, stoichiometry, and the mole concept in chemistry. The project aims to provide students with practical applications of these concepts through hands-on experiments and calculations

Project Overview

1. Introduction to Formulae, Stoichiometry, and Mole Concept

- ❖ Explain the importance of formulae in representing compounds and molecules
- ❖ Introduce the concept of stoichiometry and its relevance in chemical reactions
- ❖ Define the mole concept and its significance in measuring and calculating quantities of substances.

2. Investigating Chemical Formulas

- ❖ Guide students in performing experiments to determine the empirical formula of a compound
- ❖ Provide a set of materials and instructions for students to follow step-by-step
- ❖ Emphasize the use of balanced chemical equations and stoichiometric calculations to derive the empirical formula

3. Understanding stoichiometry in reactions

- ❖ Demonstrate the concept of stoichiometry by conducting simple chemical reactions
- ❖ Use a balanced chemical equation to illustrate the mole ratios between reactants and products
- ❖ Guide students in calculating the amounts of reactants or products using stoichiometric calculations

4. Mole Calculations and Avogadro's Number

- ❖ Explain the relationship between moles, mass, and Avogadro's number
- ❖ Provide examples and practice problems to calculate moles, mass, and number of particles
- ❖ Discuss the applications of mole calculations in various chemical contexts

5. Project Presentation

- ❖ Instruct students to prepare a presentation summarizing their understanding of formulae, stoichiometry, and the mole concept in a well written **REPORT**
- ❖ Encourage them to include real-life examples and applications of these concepts
- ❖ Provide time for students to present their projects and engage in peer discussions

6. Reflective Discussion

- ❖ Facilitate a group discussion for students to reflect on the challenges, discoveries, and applications encountered during the project
- ❖ Encourage students to share their newfound understanding of the practical significance of formulae, stoichiometry, and the mole concept in chemistry

7. Additional Considerations

- ❖ Encourage students to work in groups to foster collaboration and peer learning
- ❖ Provide interactive online resources and simulations to enhance understanding
- ❖ Offer opportunities for students to conduct virtual or small-scale lab experiments
- ❖ Assign practice problems and worksheets for reinforcement and assessment

Note: Discuss the historical background and contributions of notable scientists in the development of these concepts

Ensure safety precautions are followed during experimental activities

Online references for the project:

<https://www.khanacademy.org/science/chemistry/chemical-reactions-stoichiometry>

<https://www.phet.colorado.edu/en/simulations/category/chemistry/stoichiometry>