

## **Chemical Engineering and Cosmetics: Making the Connection Between Chemistry and Engineering Processes in Product Manufacturing**

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**Abstract**--This workshop will provide an activity for middle school and high school educators and those involved in outreach projects to assist them in promoting engineering and science careers to youth. It will also provide an opportunity to bring industrial technology into the classroom using cosmetic and personal care products as a focus. Workshop participants will explore the processes involved in the manufacture of soap and the role of the chemical engineer. Each participant will manufacture their own personal care product. Using process symbols for chemical engineering unit operations, they will design a process flow sheet that accurately describes the steps taken to make their product. In any product, each ingredient has its own essential function in the product formulation. Ingredients determine the properties and effectiveness of the final product. A discussion of the ingredients in a sampling of popular consumer products will lead to the final activity, product testing. Product testing is a necessary and important part of product manufacturing. Specifically, we will consider product testing with regards to ingredients with a function important to skin care, pH adjusters. Participants will develop an awareness of the part played by the engineer and scientist in the formulation and processing of products that they use everyday.

Chemical engineers use science and mathematics to transform materials in nature into an amazing variety of products that we use every day. These products include cosmetics, medicine, clothing, food and toys, just to name a few. The chemical engineer develops a **PROCESS** which describes how you take the materials (chemicals) and combine them to form a **PRODUCT**. A **PROCESS** is an orderly description of each task that must be accomplished to make the product. You can think of following a recipe to make a cake as an example of a process. If you do not follow the directions properly, you will not get the best looking or best tasting cake.

The proper chemistry required to make a product is essential. It is here that scientists and engineers work together. Chemists provide the chemistry needed to make a product. The engineer takes the chemical recipe and forms it into a series of steps (the process) defined by equipment needed to perform each step. The chemistry defines the order of each step in the process and the engineer uses mathematics to determine how much product can be made, the quantity of initial ingredients needed and how fast the product can be made. This is of course very important, since a company wants to make a product that is affordable for people, as well as profitable.

In this paper we present an activity suitable for middle and high school students. The student makes a cosmetic product that they can keep. Once they have experienced the steps involved in

# Chemical Engineering And Cosmetics Making The Connection

**J Rink**



## **Chemical Engineering And Cosmetics Making The Connection:**

**Chemical Engineering Catalog** ,1920      **Industrial and Engineering Chemistry** ,1925      **Industrial & Engineering Chemistry** ,1923      *The Chemical Trade Journal and Chemical Engineer* ,1930      **A Legislative History of the Federal Food, Drug, and Cosmetic Act and Its Amendments: Text** ,1979      The Chemical Trade Journal and Chemical Engineer G Kelville Davis,1929      **Official Gazette of the United States Patent and Trademark Office** ,2002  
*Chemical and Engineering News* Harrison Estell Howe,Walter Joseph Murphy,1949      **Hearings** United States. Congress. House,1935      *Electrochemical and Metallurgical Industry* Eugene Franz Roeber,Howard Coon Parmelee,1920

**Nanomaterials for Solar Cell Applications** Sabu Thomas,El Hadji Mamour Sakho,Nandakumar Kalarikkal,Oluwatobi Samuel Oluwafemi,Jihuai Wu,2019-06-12 Nanomaterials for Solar Cell Applications provides a review of recent developments in the field of nanomaterials based solar cells It begins with a discussion of the fundamentals of nanomaterials for solar cells including a discussion of lifecycle assessments and characterization techniques Next it reviews various types of solar cells i e Thin film Metal oxide Nanowire Nanorod and Nanoporous materials and more Other topics covered include a review of quantum dot sensitized and perovskite and polymer nanocomposites based solar cells This book is an ideal resource for those working in this evolving field of nanomaterials and renewable energy Provides a well organized approach to the use of nanomaterials for solar cell applications Discusses the synthesis characterization and applications of traditional and new material Includes coverage of emerging nanomaterials such as graphene graphene derivatives and perovskites

**The Manufacturing Chemist & Pharmaceutical, Cosmetic & Perfumery Trade Journal** ,1936      *Everyday Engineering Magazine* ,1919      *Soap* ,1937      Oil, Paint and Drug Reporter and New York Druggists' Price Current ,1916 Vols include the proceedings some summarized some official stenographic reports of the National Wholesale Druggists Association called 18 1882 Western Wholesale Druggists Association and of other similar organizations      Soap, perfumery & cosmetics ,1963

**Drug & Cosmetic Industry** ,1940      **Soap and Sanitary Chemicals** ,1946 Accompanied by annual buyers guide called Soap and sanitary chemicals blue book and catalog edition      Business Publication Advertising Source ,2006      Drug and Chemical Markets ,1914

## Decoding **Chemical Engineering And Cosmetics Making The Connection**: Revealing the Captivating Potential of Verbal Expression

In a time characterized by interconnectedness and an insatiable thirst for knowledge, the captivating potential of verbal expression has emerged as a formidable force. Its power to evoke sentiments, stimulate introspection, and incite profound transformations is genuinely awe-inspiring. Within the pages of "**Chemical Engineering And Cosmetics Making The Connection**," a mesmerizing literary creation penned by way of a celebrated wordsmith, readers embark on an enlightening odyssey, unraveling the intricate significance of language and its enduring impact on our lives. In this appraisal, we shall explore the book's central themes, evaluate its distinctive writing style, and gauge its pervasive influence on the hearts and minds of its readership.

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