

THE FINAL WORD

The official e-newsletter of Industrial chemistry(IC) department, V.V.Nagar, Anand, Gujarat
M. Sc. Industrial Chemistry

M. Sc. Industrial Chemistry

January 2019

1. Student Participation in various National Conference

Institute of Science & Technology for Advanced Studies & Research
Affiliated to Sardar Patel University
Recognized under Section 2(f) and 12(B) of the UGC Act, 1956

ESSENTIAL OIL

Introduction

An essential oil is a concentrated hydrophobic liquid containing volatile (defined as "the tendency of a substance to vaporize") aroma compounds from plants. Essential oils are also known as volatile oils, etheral oils, aetheroles, or simply as the oil of the plant from which they were extracted, such as oil of clove. An essential oil is "essential" in the sense that it contains the "essence" of the plant's fragrance—the characteristic fragrance of the plant from which it is derived. The term essential used here does not mean indispensable as with the terms essential amino acid or essential fatty acid which are so called since they are nutritionally required by a given living organism. In contrast to fatty oils, essential oils typically evaporate completely without leaving a stain or residue.

Essential oils are generally extracted by distillation. Offer by using steam. Other processes include expression, solvent extraction, steamure, absolute of extraction, resin tapping, wax embedding, and cold pressing. They are used in perfumes, cosmetics, soaps and other products, for flavoring food and drink, and for adding scents to incense and household cleaning products.



Methods

Most common essential oils such as lavender, peppermint, tea tree oil, patchouli, and eucalyptus are distilled. Raw plant material, consisting of the flowers, leaves, wood, bark, roots, seeds, or peel, is put into an alembic (distillation apparatus) over water. As the water is heated, the steam passes through the plant material, vaporizing the volatile compounds. The vapor goes through a coil where they condense back to liquid, which is then collected in the receiving vessel. Most oils are distilled in a single process. One exception is ylang-ylang (Cannaceae) which is purified through a fractional distillation.

The noncondensed water is referred to as a hydrosol, hydrolat, herbal distillate, or plant water essence, which may be sold as another fragrant product. Hydrosols include rose water, lavender water, lemon-balm, clay sage, and orange blossom water. The use of herbal distillates oils in cosmetics is increasing.

TYPE OF ESSENTIAL OIL

TEA TREE OIL
CLOVE OIL
ORANGE OIL
LAVENDER
LEMONGRASS
LEMON OIL
LEMONGRASS

Figure #1  **Figure #2** 

USES

- Treatment against acne – An effective remedy is to apply the oil on the affected areas before going to sleep.
- It has been found to accelerate the healing process of wounds while elevating discomfort.
- Treatment for fungus of the nail of the foot. Apply 1 to 2 drops of the oil directly on the infected nails and rub it up and under the top of the nail. Repeat this once a day.
- Treatment for warts

Biography

1.A SHUTOSH P.PATEL
2.ARPRIT S.PATEL
3.SHAHMUK S.PATEL

Institute of Science & Technology for Advanced Studies & Research
Affiliated to Sardar Patel University
Recognized under Section 2(f) and 12(B) of the UGC Act, 1956

ESSENTIAL OIL AND IT'S ANTIMICROBIAL ACTIVITY

Introduction

A natural oil typically obtained by a distillation and having the characteristics fragrance of the plant or the other source from which it is extracted.

Abstract

Extensive documentation on the antimicrobial properties of essential oils and their constituents has been carried out by several workers. Although the mechanism of action of a few essential oil components has been elucidated in many pioneering works in the past, detailed knowledge of most of the compounds and their mechanism of action is still lacking. This knowledge is particularly important for the determination of the effect of essential oils on different microorganisms, how they work in combination with other antimicrobial compounds, and their interaction with food matrix component.

Main activity of essential oil

1. Antimicrobial activity
2. Antioxidant activity
3. Insecticidal activity

Anti-microbial activity

An antimicrobial is an agent that kills microorganisms or stops their growth. Antimicrobial medicines can be grouped according to the microorganisms they act primarily against.

Presented by: Dvijendrasinh Rathod
Hemant Kumar Mali
Dayabhai Kamaliya

Topic Name : Essential Oil
Presented By : Ashutosh Patel
Arpit Patel
Bhaumik Patel
Science Manthan-2019
CHARUSAT, Changa

Topic Name : Essential Oil & It's Antimicrobial Activity
Presented By : Dvijendrasinh Rathod
Hemant Kumar Mali
Dayabhai Kamaliya
Science Manthan-2019
CHARUSAT, Changa

Institute of Science & Technology for Advanced Studies & Research
Department of Industrial Chemistry, ISTAR College, Vallabh Vidyanagar

Bioadhesive For Wood

Rushi Makati & Bhavin A. Nandaniya

Department of Industrial Chemistry, ISTAR College, Vallabh Vidyanagar

Abstract: This paper has been a study of research and innovation of bio-based adhesives in the segment of wood products industry. This presentation includes synthesis of bioadhesives derived from natural resources in lignin, starch, and plant protein. Some characteristics have been reported to ensure products from natural origin and that protein is made a bio-adhesive. However, the lactide from bio-based wood adhesives such as such as affordable than petroleum-based wood adhesives.

Keywords: bio-based adhesives, protein adhesives, defined data

INTRODUCTION

Bioadhesive has several potential advantages that are not as adhesive. There is a lot of research and innovation in the segment of wood products industry. This presentation includes synthesis of bioadhesives derived from natural resources in lignin, starch, and plant protein. Some characteristics have been reported to ensure products from natural origin and that protein is made a bio-adhesive. However, the lactide from bio-based wood adhesives such as such as affordable than petroleum-based wood adhesives.

Types of Bioadhesive

1. Lignin
2. Starch
3. Protein
4. Plant Protein
5. Cellulose
6. Chitin
7. Collagen
8. Keratin
9. Silk
10. Elastin
11. Hyaluronic Acid
12. Chondroitin Sulfate
13. Heparin
14. Dermatan Sulfate
15. Alginate
16. Carrageenan
17. Pectin
18. Xanthan Gum
19. Guar Gum
20. Gum Arabic
21. Tragacanth
22. Gelatin
23. Casein
24. Soy Protein
25. Whey Protein
26. Egg Protein
27. Fish Protein
28. Insect Protein
29. Plant Protein
30. Cellulose
31. Chitin
32. Collagen
33. Keratin
34. Elastin
35. Hyaluronic Acid
36. Chondroitin Sulfate
37. Heparin
38. Dermatan Sulfate
39. Alginate
40. Carrageenan
41. Pectin
42. Xanthan Gum
43. Guar Gum
44. Gum Arabic
45. Tragacanth
46. Gelatin
47. Casein
48. Soy Protein
49. Whey Protein
50. Egg Protein
51. Fish Protein
52. Insect Protein

PROCESS

Extraction of protein from defined cells: Protein was extracted from protein-rich sources. The extraction process involved the use of a defined solvent system. The protein was then purified and characterized.

Preparation of protein adhesive: The protein was reacted with a cross-linker to form a protein adhesive. The reaction was carried out under controlled conditions. The adhesive was then characterized and tested for its adhesive properties.

Lignin based bioadhesive: Lignin was extracted from wood waste. The extraction process involved the use of a defined solvent system. The lignin was then purified and characterized.

Starch based bioadhesive: Starch was extracted from potato tubers. The extraction process involved the use of a defined solvent system. The starch was then purified and characterized.

Plant protein based bioadhesive: Plant protein was extracted from various sources. The extraction process involved the use of a defined solvent system. The protein was then purified and characterized.

Topic Name : Bioadhesive For Wood
Presented By : Rushi Makati
Bhavin Nandaniya
Science Meet-2019
Shri A.N. Patel College, Anand

Institute of Science & Technology for Advanced Studies & Research
Department of Industrial Chemistry, ISTAR College, Vallabh Vidyanagar

Synthesis of Polyester Polyol using renewable resource

Jagat Sevak, Devendra Jadav & Dr. Mandar Karve

Department of Industrial Chemistry, ISTAR College, Vallabh Vidyanagar

Abstract: Polyurethanes have been used in very wide applications such as rigid and flexible foams, coatings, adhesives, and elastomers. However, the use of bio-based resources in the synthesis of polyurethanes has been limited. This work reports the synthesis of polyester polyols from renewable resources. The polyols were synthesized from renewable resources and characterized. The polyols were then used in the synthesis of polyurethanes. The polyurethanes were characterized and tested for their properties.

Keywords: Polyester polyol; renewable resource; polyesterification.

Introduction

Polyester polyols based on aliphatic and aromatic dicarboxylic acids are one of the most important materials in polymer technologies. Vegetable oils are one of the most important renewable resources in the chemical industry due to their biodegradability, availability, low-cost production, environmental acceptance, renewability, and non-toxic nature. The oil derivatives, such as fatty acids, fatty acid esters, and crude glycerol can be obtained via hydrolysis or transesterification of vegetable oil. In this work, production of polyester polyols was carried out by using dicarboxylic acids, diols, triols, and polyols from renewable resources with presence of a catalyst.

Materials and Methods: Adipic acid, phthalic acid, sebacic acid, ethylene glycol, diethylene glycol, trimethylolpropane glycerol were used.

Results and Discussion: The results of the synthesis of polyester polyols are presented in this paper. The polyols were characterized by FTIR, ¹H NMR, and GPC. The polyols were then used in the synthesis of polyurethanes. The polyurethanes were characterized and tested for their properties.

Topic Name : Synthesis of Polyester Polyol using renewable resource
Presented By : Dr. Mandar Karve
Jagat Sevak
Devendra Jadav
Science Manthan-2019
CHARUSAT, Changa

ISTAR
Institute of Science & Technology
for Advanced Studies & Research
Affiliated to Sardar Patel University
Recognized under Section 2(f) and 12(B) of the UGC Act, 1956
Estd. 1999

Preparation of Soap from castor oil
Sarjan A. Rathava, Mitesh D. Patel and*Dr. Mandar Karve

Abstract
Soap are produce from castor oil. They are prepared by saponification process, which is, reacting the oil which contain triglycerides with caustic soda (NaOH) to give the soap. However different oil have different composition of fatty acid which are responsible for different properties of soap made out them. In the work castor oil are taken. Castor oil is triglyceride in which approximately 90% of fatty acid chain are ricinoleates. This soap has cleansing and lathering properties of all sample were compared.

Introduction
The cleaning action of soaps because of their ability to emulsify or disperse water-insoluble material and hold them in the suspension of water. This ability is seen from the molecular structure of soaps. When soap is added to water that contains oil or other water-insoluble materials, the soap or detergent molecules surround the oil droplets. The oil is dissolved in the alkyl group of the soap molecules while the ionic end allows it to be dissolved in water. As a result, the oil droplets are to be dispersed throughout the water and can be washed away.

Properties

Property	Sample 1	Sample 2	Sample 3
Alkalinity	High	High	High
Lathering Power	High	High	High
Cleansing Power	High	High	High
Moisture Content	High	High	High
Total Fatty Matter	High	High	High
Free Alkali Content	High	High	High

Figure #1 **Figure #2**

Calculation of Yield:
For all the soap samples prepared using different soap making oils, weight is taken after they are taken out of the air oven. Yield is calculated by dividing the weight of the soap by the weight of the oil taken multiplied by 100. It is calculated for all the samples.

Why Castor Soap??
Heals inflamed skin
Reduces acne
Moisturizes skin
Fades blemishes
Prevent stretch marks

ACKNOWLEDGMENT
I would also like to thank Dr. Mandar Karve for the wonderful support they gave to me. I would also like to thank all technical assistants in our department for their constant help. Last but not the least, I wish to profoundly acknowledge my parents for their constant support.

Reference
Abayeh, O. J, Alina, E. A and Okuonghae Oil content and oil quality characteristics of some Nigerian oil seeds. Journal of pure and Applied sciences; 17- 23(1998).

Good Soap Contain

- A good soap gets dissolved easily and remove stains from the clothes, human skin or any material being cleaned.
- It gets dissolved in water and produces enough suds.
- It gives a clear and sparkling kind of cleanliness.
- It gives a pleasant smell.
- A good soap does not leave sticky traces on the clothes or on the skin.
- It has a good color that is even and does not streak.
- It disinfects and kills germs.
- It does not damage the fibers or textiles.

ISTAR **SARDAR PATEL UNIVERSITY**

SOLAR ENERGY SAVES YOU MONEY

Solar energy received by the earth is converted to electricity via photovoltaic (PV) panels.

Electricity produced by PV panels, which last 25 years, reduces electricity consumption and reduces diesel consumption from private generator.

8 Innovations in Solar PV Technology



Streetlights
The Sun charges batteries during the day, which then powers LEDs.



Vaccine Refrigerators
For remote areas healthcare purpose.



Solar Ovens
Ideal for reducing air pollution that result from burning fuel.



Tents
PV Cells store solar energy by day then used to illuminate the tent at night.



Cell Charger
Ideal for outdoor excursions.



Locks
Built in solar panel provide power.



Solar Fabrics
Generates convenient solar electricity.



Solar Paints
Thin solar cells generates clean, green power.

**Solar energy works
It saves money & reduce pollution**

Prepared By -
Parth Bhatt (17CS50)
Mohammadsahil Dalal (17C43)

Topic Name : Preparation of Soap From Castor oil

Presented By : Dr. Mandar Karve
Sarjan Rathava
Mitesh Patel

At : Science Manthan-2019
CHARUSAT, Changa

Topic Name : Solar Energy Saves You Money

Presented By : Parth Bhatt
Mohammadsahil Dalal

At : Science Manthan-2019
CHARUSAT, Changa

02. Christmas & 31st Celebration in IC department



03. IC in Sports

1. Badminton (Man's Doubles)

Rushi Makati & Karan Solanki Are Champions in Interclass

Jaimin Joshi & Adil vohra are Runner's up in Interclass

2. Badminton (Mix Doubles)

Rushi Makati & Sweta Chauhan are Runner's up in Interclass

3. Triple jump

Anis Malek secured 3rd Position in 58th Intercollegiate Athletics

Championship 2018-19, SPU

4. Table Tennis (Singles)

Jeimin Joshi Champion in Interclass

5. Table Tennis (Doubles)

Jeimin Joshi & Harsh Patel are Champions in Interclass

Harshit Ganatra & Rushabh Shah are Runner's up in Interclass

04 .PLACEMENT DETAILS- 2018-19

Sr. No.	Name of the Industry	Post	Number of students Selected
1.	LUPIN Ltd. - Ankleshwar	Production Officer	6
2.	LUPIN Ltd. - Ankleshwar	Quality Control Officer	1
3.	LUPIN Ltd. - Dabhasa	Production Officer	5
4.	LUPIN Ltd. - Dabhasa	Quality Control Officer	2
5.	LUPIN Ltd. - Bhopal	Production Officer	3
6.	CBCC globe Research, Ahemdabad	QA -QC	2
7.	CBCC globe Research, Ahemdabad	Clinical Operation	4
8.	CBCC globe Research, Ahemdabad	Clinical Pharmacology	1
9.	AARAV Enterprise, Mumbai	Chemical Assistant	1
10.	Zydus Cadila - Ankleshwar	Production Officer	6
11.	Zydus Cadila - Dabhasa	Production Officer	2
12.	Royal Caster - Siddhapur	Plant Supervisor	3
13.	Clianth Research Ltd, Ahemdabad	QA -Officer	3
14.	Clianth Research Ltd, Ahemdabad	Bio Analytical Officer	6
15.	CTX Life Science, Surat	Production Officer	1
		Total	46