MKR GOVERNMENT DEGREE COLLEGE.
Devarakonda Dist:- NALGONDA

DEPARTMENT OF CHEMISTRY

PROJECT WORK

2018-19

Name of the students :
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MKR GOVT DEGREE COLLEGE
DEVARAKONDA.

Subject : CHEMISTRY

STUDY PROJECT

FOOD ADDULTRATION

BY
Mb.Zc III Year Students

Students :
1. D. PRIYANKA.
2 SK. RESMA.
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నెయ్యిలో వనస్పతి

నెయ్యిలో వనస్పతిని కలుపుతారు. డాల్డా కూడా కలుపుతారు. బంగాళదుంప, చిలగడ దుంపలను మెత్తగా చేసి కలుపుతారు.

నిర్ధారణ:-

ఇందులో కల్తీని గుర్తించాలంటే 5 మి.లీ ఆయిల్ల నెయ్యిలో 5 మి.లీ గాఢ హైడ్రోక్లోరిక్ ఆమ్లం కలపాలి. కొద్దిగా చక్కెరను చేర్చాలి. అప్పుడు నెయ్యి ఎరుపు రంగులోకి మారితే కల్తీ అయినట్లే.

నష్టం

* దీనివల్ల గుండె జబ్బు వచ్చే అవకాశం ఉంటుంది.

* దీనివల్ల కొవ్వు (fat) ఎక్కువగా పెరిగే అవకాశం ఉంటుంది.

పాలల్లో కల్తీ

పాలు చిక్కగా కనిపించటం కోసం బియ్యంపిండి, గంజి కలుపుతారు.

నిర్ధారణ:-

కల్తీ పాలను గుర్తించటానికి చిన్నపాత్రలో కాచి చల్లార్చిన పాలు తీసుకొని దానికి నాలుగైదు చుక్కల అయోడిన్ (ఉప్పు) కలపాలి. అప్పుడు పాలు నీలి రంగులోకి మారితే కల్తీ జరిగాయనే విషయాన్ని నిర్ధారించవచ్చు.

నష్టాలు

*

నూనెల్లో కల్తీ

శనగ నూనెలో కాటన్ ఆయిల్, కొబ్బరి నూనెలో వైట్ ఆయిల్, ఆముదం నువ్వుల నూనెలో పొగాకు నూనె కల్తీ అవుతుంది.

వంటనూనెలో పశువుల ఎముకల తయారీ నూనె కూడా కలుపుతారు.

నిర్ధారణ:-

కొబ్బరి నూనెను ఫ్రిజ్‌లో పెట్టాలి. అది రెండు లేయర్లుగా మారితే కల్తీ గూడా నిర్ధారించవచ్చు.

నష్టాలు

* పశువుల ఎముకల నూనె వల్ల పక్షవాత సమస్యలు ఎదురవుతాయి.

* ఈ నూనెల వల్ల అనారోగ్య సమస్యలు తలెత్తుతాయి.

కాఫీ, టీ పొడులలో కల్తీ

కాఫీ, టీ పొడులలో సాధారణంగా వేయించిన ఈత గింజలు, చింతగింజల పొడులను కలుపుతారు.

నిర్ధారణ:

కాఫీ పొడి అయినా టీపొడి అయినా కొంచెం తీసుకొని నీళ్లలో వేసి మంచిదైతే పైకి తేలుతుంది. లేదంటే మునుగుతుంది.

కందిపప్పులో కల్తీ:

కందిపప్పులో కేసరిపప్పు (లంకపప్పు) ను కలుపుతారు.

నిర్ధారణ:

కొద్దిగా కందిపప్పును తీసుకొని నీటిలో 10 నిమిషాలు ఉంచితే నీటి రంగు మారితే కల్తీ అయినట్లు.

నష్టాలు

* దీనివల్ల పక్షవాత సమస్యలు వస్తాయి.

చక్కెరలో కల్తీ

చక్కెరలో బొంబాయి రవ్వ, బియ్యం పిండిని కలుపుతారు.

నిర్ధారణ:

పాలు లేదా నీళ్లలో చెంచా పంచదార వేయాలి. అందులో రవ్వ కలిసి ఉంటే అడుగున తెల్లనిపొర ఏర్పడుతుంది.

తేనెలో కల్తీ

తేనెలో బెల్లం పాకం కలుపుతారు.

నిర్ధారణ:

శుభ్రమైన వస్త్రం ముక్కను తేనెలో తడిపి అగ్గిపుల్లతో వెలిగించాలి. అది స్వచ్ఛమైన తేనె అయితే మంట బాగా మండుతుంది. కల్తీ అయితే కాలిన తర్వాత ఆరిపోతుంది.

గాజు పాత్రలో నీళ్లు తీసుకొని అందులో చెంచా తేనె వేయాలి. పాకం అయితే కరిగిపోయి నీటి రంగులోకి మారిపోతుంది. అది స్వచ్ఛమైన తేనె అయితే వేసిన చోటే ముద్దలా ఉండిపోతుంది.

కారంలో కల్తీ

కారం ఎర్రగా ఆకర్షణీయంగా ఉండటానికి లెడ్‌క్రోమేట్ వంటి రంగును చేరుస్తారు.

రంపపు పొట్టును కలుపుతారు. ఇటుక పొడిని కూడా కలుపుతారు.

నిర్ధారణ:

గాజు పాత్రల్లో నీళ్లు పోసి అందులో కారం పొడిని చెంచావంతున వేస్తే కల్తీ అయితే ఇసుక పొడి అడుగుభాగాన చేరుతుంది. రంపపు పొట్టు అయితే నీళ్లపై భాగాన తేలుతుంది.

నీటితో పాటు కలిసిపోతే స్వచ్ఛమైనదిగా గుర్తించాలి.

నష్టాలు

* అల్సర్, నేత్ర సంబంధిత సమస్యలు తలెత్తుతాయి.
* కడుపులో మంట, కడుపు నొప్పి లాంటి వ్యాధులు వస్తాయి.

ధనియాలలో కల్తీ

ధనియాల పొడిలో ఉప్పు కలుపుతారు. చెక్క పొట్టు ను కూడా కలుపుతారు.

నిర్ధారణ:

గాజు పాత్రలో నీళ్ళు తీసుకొని అందులో ధనియాల పొడిని చెంచావంతున వేస్తే కల్తీ అయితే పైభాగాన చెక్కపొట్టు తేలుతుంది.

నీటితో పాటు కలిసిపోతే స్వచ్ఛమైనవిగా గుర్తించాలి.

పసుపులో కల్తీ

పసుపు పొడిలో జొన్న, బియ్యం, గోధుమ, గంజి పొడుల్ని కలుపుతారు. ఇందులో మెథల్లిన్ అనే పసుపు రంగును వేస్తారు.

నిర్ధారణ:

గాజు పాత్రల్లో నీళ్లు తీసుకొని అందులో పసుపు పొడిని చెంచా వంతున వేస్తే కల్తీ అయితే పైభాగాన పొరపొరలుగా వస్తుంది.

నష్టాలు:

* చర్మం సంబంధిత వ్యాధులు వస్తాయి.

అల్లం వెల్లుల్లి లో కల్తీ

అల్లం వెల్లుల్లి పేస్టులో అటి బెరడులను పేస్టులా చేసి కలుపుతారు.

నిర్ధారణ:

అల్లం వెల్లుల్లి పేస్టులో కల్తీ అయితే పేస్టులో చాలా భాగం నీరుతో నిండి వుంటుంది.

MKR GOVT. DEGREE COLLEGE
DEVARAKONDA.

PROJECT WORK
2018-19

CHEMISTRY.

Topic : Synthasis OF 4- Amino benzene Sulphonamide.

Name of the Students :

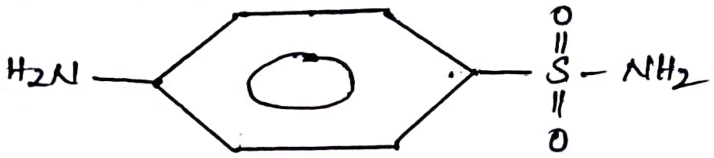
1. B. Ashok
2. P. Sheevaleela
3. SK. Fareeda

Synthesis of 4-Amio benzene sulphonamide

AIM: To synthesize an anti bacterial drug

chemical: 4 amino benzene sulphonamide

Structure:



pharmocological: activity:

An Anti bacterial drug cures by retording the growth of the disease causing bacteria

principle: synthesis of sulphonamide involes three steps

step:1: Electrophilic substitution of chloro sulphoyl group in the para position of acetanilide

step:2 p-acetamido bezene sulphonyl chloride is converted into p-acetomido bezene sulphonamide

step:3 Hydrolysis of p-acetomido benzene sulphonamide in the fromation of sulphonamide (p-amino benzene sulphanilamide)

step:1 prepartion of p-acetamido benzene sulphonyl

chemicals: Acetanilide, chloro sulphonic acid conc Ammonia dil, sulfuric acid.

Apparatus required: R.B. Flask . condenser

procedure:- Take 8ml of chlorosulphonic acid in R.B flask and 3gm of acetanilide with cooling and stirring the R.B Flask is fitted with water condenser and heated it to 60°- 70°c for 15-20 minutes on a water bath cool to room temp and pour this contents into crushed ice p-acetamido benzene sulfonyl chloride seperates out Filter at pump

Recrystallization:- Solvent : alcohal

Melting point: 142°- 145°c

Step-2: preparation of p-acetamido benzene sulphonamide

chemicals:- 6N : Ammonia. dil sulphuric acid p-acetamido benzene Sulfonyl chlorido

Apparatus required: conical flask, thermometer

procedure: the above crude sulphonyl chloride was taken in a conical flask and slowly add 6N ammonia solution till a smooth paste abtained. Heat at 70°c for 20 minutes with constant stirring cool at room temparature Acidity with dilute sulphuric acid filter the ppt wash with water and recrystallizo it.

Recrystallization: solvent water.

MP : 219°c
yield: 0.5gm

step3: preparation of sulphonilamide.

procedure: Take 2gm of p-acetamido benzene sulphonamide and 3ml cons Hcl and 5ml of water into a clean R.B flask then boiled gently under reflux for 1hr Transfer into 250ml beaker add powdered sodium cabonate in small quantity sulphonilamide seperates out on cooling filter the product

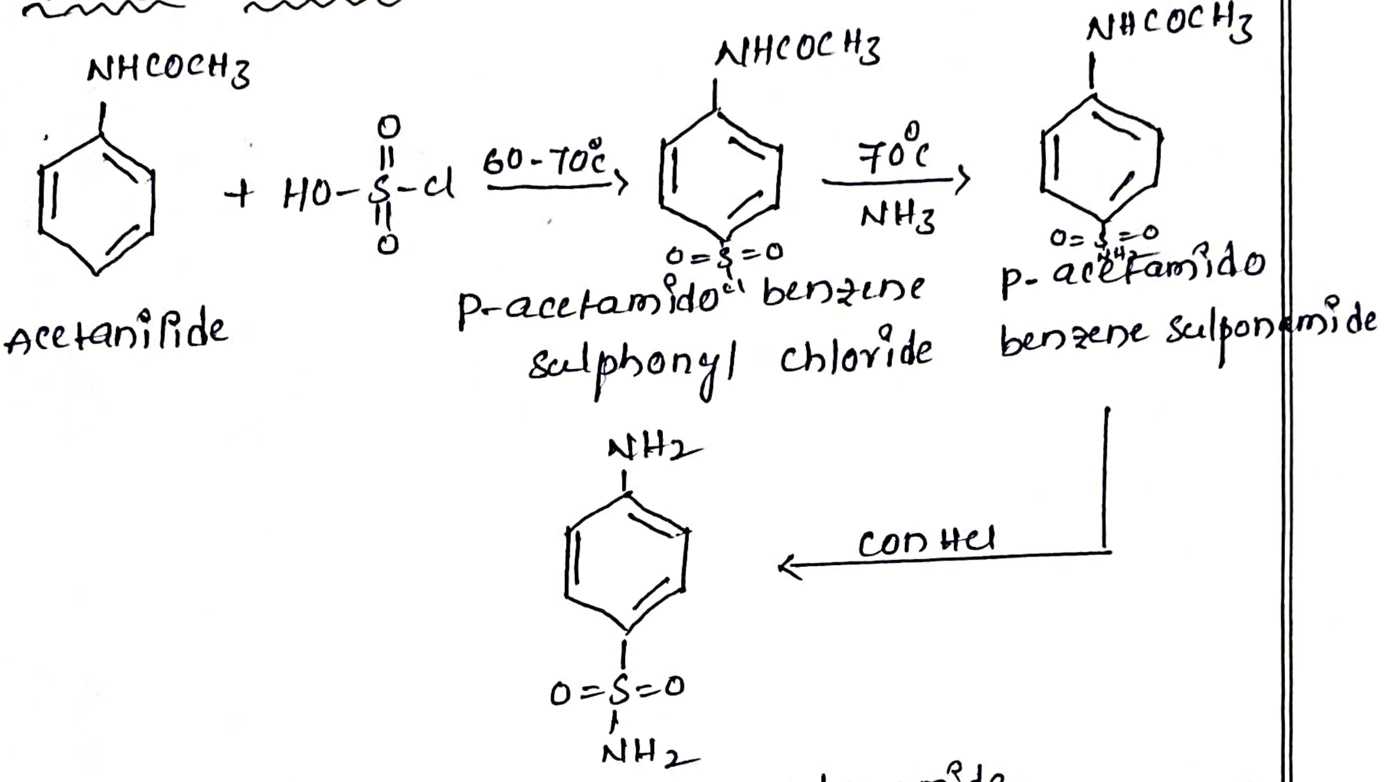
uses: sulphonilamide is used as anti bacterial agent It has bacteriostatic action agaist disease causing bactria like streptococci

Recry stallization: Solvent water

yield: 0.9 gm

M.P: 183°c

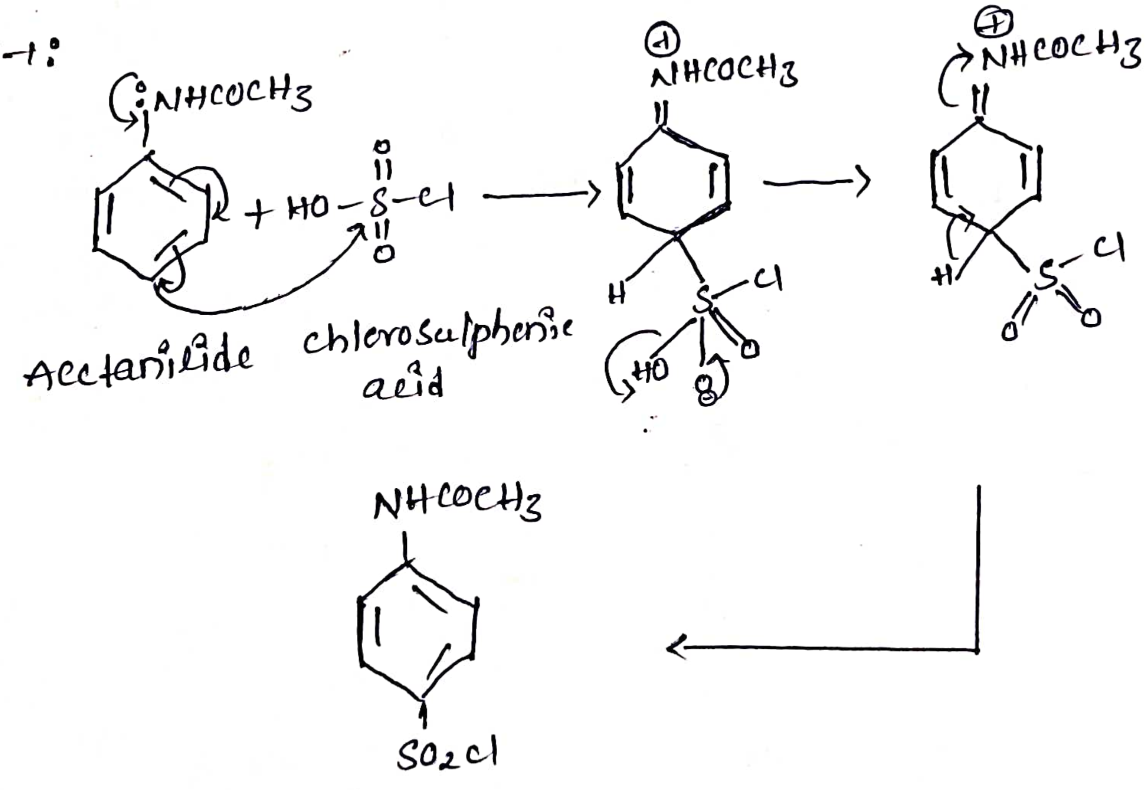
chemical reaction



p-amino benzene sulphonamide.

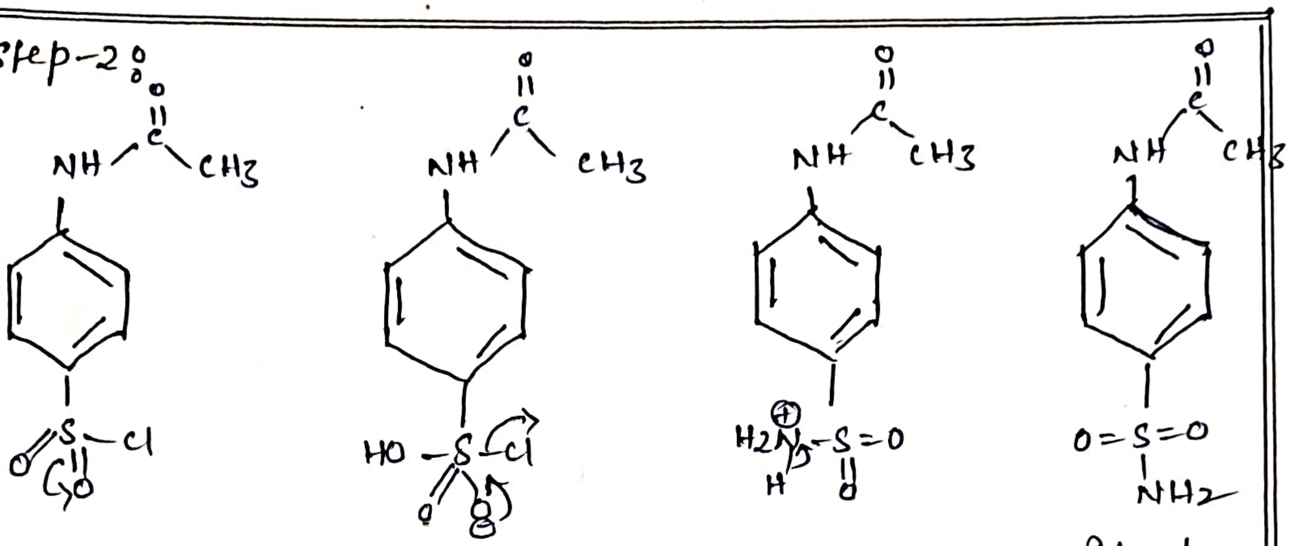
Mechanism:

Step-1:



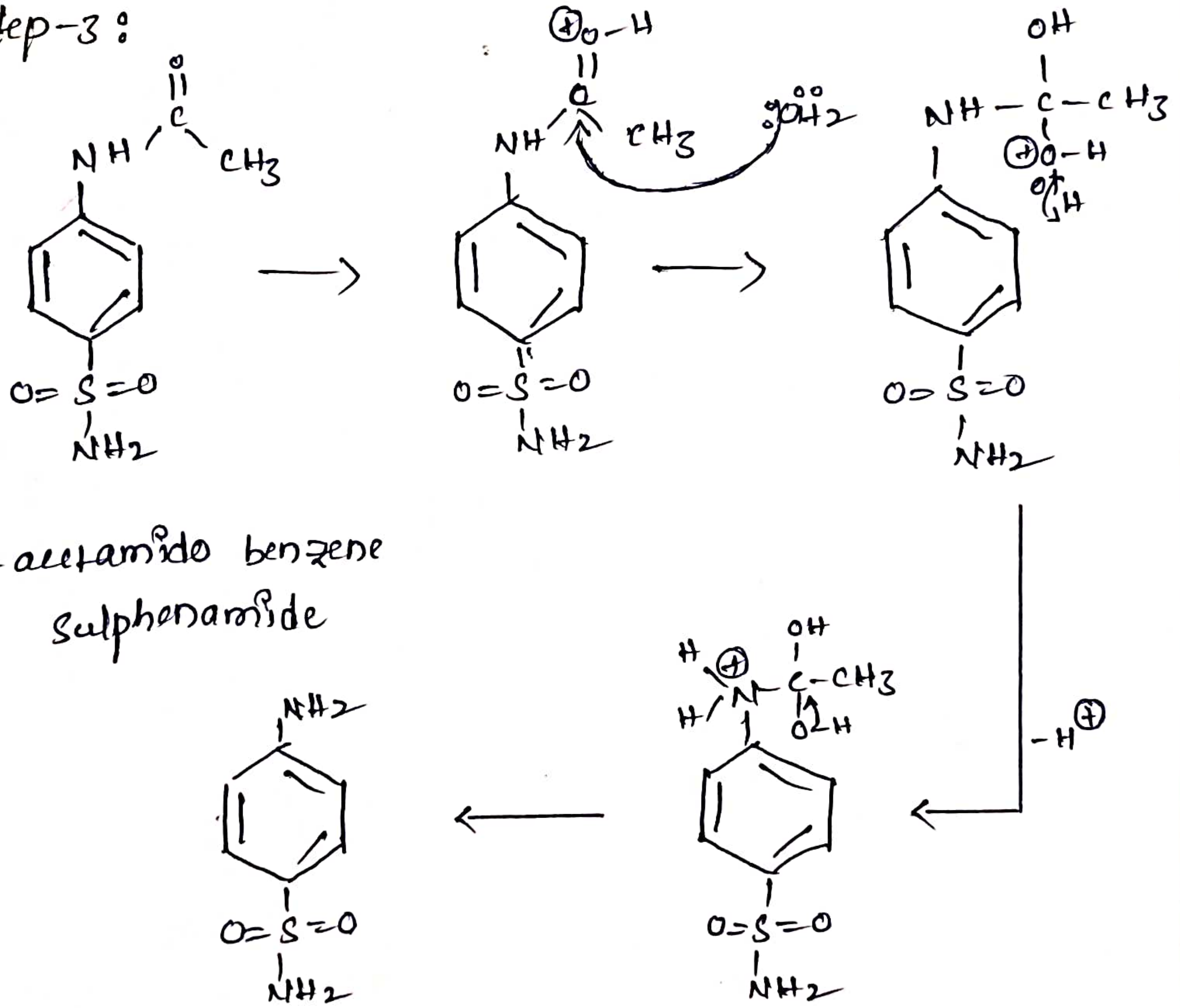
p-acetamido benzene sulphonyl chloride.

Step-2:



p-acetamido benzene sulphonamide

Step-3:



p-acetamido benzene sulphenamide

p-amino benzene sulpenamide.

MKR Govt. Degree college.

Devarakonda.

Department of chemistry.

Project Work 2019-20

Determination of Contents in tooth powder / Paste.

Team - B:

A. Lingaiah
J. Lingaiah.
R. Srikanth.
A. Dhankoti

ITLE :- DETERMINATION OF CONTENTS F TOOTH POWDER/PASTE.

ntroduction :- Toothpaste is a paste or gel dentirice. Used with a toothbrush to clean and maintain he aesthetics and health of teeth. Toothpaste is. sed to promote oral hygiene. It is a abrasive. hat aids in removing dental plaque. and food rom the teeth, assist in suppresing halitosis, nd delivers active ingredients (mostly commonly flouride) o help prevent tooth decay (dental caries) and gum. isease (gingivitis). Owing to differences in compo sition and flouride content, not all toothpastes re equally effective in maintaining. oral health. he decline of tooth during the 20th century has een attributed to the introduction and regular. se of flouride- containg toothpastes world wide. large amounts of swallowed toothpaste can be toxic.

> Usefulness : Toothpaste are generally useful

to maintain dental health. Toothpastes containing flouride are effective at preventing tooth decay. Toothpastes may also help to control and remove plaque build-up, promoting health gums. A 2016 systematic review indicated that using tooth paste when brushing the teeth does not necessarily impact the level plaque removal. However. the active ingredients in toothpastes are able to prevent dental diseases with regular use.

Meterials and Methods: Toothpastes are derived from a variety of components. the three main one's being abrasives, flouride, and detergent.

Abrasives: Abrasives constitute 8-20% of a typical toothpaste. these insoluble practicles are designed to help remove plaque from the accumulation of tartar (calculus) helping to minimize the risk of gum disease. Representative abrasives include particles of aluminium hydroxide ($Al(OH)_3$), calcium carbonate ($CaCO_3$), sodium bicarbonate, various calcium hydrogen phosphates, various sillicas and zeolites and hydroxyapatite ($Ca_5(PO_4)_3OH$)

The abrasive effect of toothpaste is indicated. by it's RDA value. Toothpastes with RDA valuable above 250 are potentially damaging to the surfaces. of teeth. The American National Standards Institu and Americal Dental Association considers toothpastes with an RDA below 250 to be safe and effective for a lifetime of use.

Fluorides :- Fluoride in various forms is the most Popular and effective active ingredient in tooth paste to prevent cavities.. Fluoride is present in small amounts in plants, animals, and some natural water sources. The additional flouride in toothpaste has beneficial effects on the formation of dental enamel and bones.

Sodium fluoride (NaF) is the most common. source of fluoride, but stannous fluoride (SnF_2) and sodium monofluorophosphate. (Na_2PO_3F) are also used. At simillar fluoride concentrations. toothpastes containing. stannous fluoride have been shown to be more effective than toothpaste. containing sodium fluoride for reducing the incidence of dental caries and dental erosion.

as well as reducing gingivitis. Much of the toothpaste sold in the united states has 1100 parts per million fluoride. For European Country. Such as the UK or Greece the fluoride content of 0.312% w/w (or) Stannous fluoride contents of 0.454% w/w (1.100 ppm) decreasing the number of mutans. streptococci and lactobacilli and possibly promoting calcium fluoride deposits. to higher degree than after the use of traditional fluoride containing dentifrices.

- **Surfactants** :- Many, although not all, toothpastes contain Sodium lauryl Sulfate (SLS) or related Surfactants (detergents). SLS is found in many other personal care products as well such as Shampo, and is mainly a foaming agent, which enables uniform distribution of toothpaste improving it's cleansing power.

Other Components:

→ Antibacterial agents.
→ Flavorants.
→ Remineralizing agents.
→ Xylitol
→ Miscellaneous Components.

Conclusion :

Early toothpastes: Since 5000 BC, the Egyptians made a tooth powder, which consisted of powdered ashes ~~fo~~of ox hooves, and Pamice. The Greeks, and then the Romans, improved the reciepes by adding abrasives such as. crushed bones and oyster shells.

In ~~9~~ 9th century.. Irqui musician and fashion designer Ziryab invented a type of toothpaste, which he popularized throughout Islamic Spain. The exact ingredients of this toothpaste are the unknow, but it was reported too have been both functional and pleasant to taste. It is not know whether these early toothpastes were to be used with early toothbrushes such as neem tree twigs and miswak. During Japan 'Edo period' inventor Hiraga Gennai's Hik rakyo (1769) contained advertisement for sosekiko a tooth pastes in a box. Toothpastes or) powders are come into general use in the 19th century

Tooth Powder :- Tooth powders for use with tooth brushes came into general use in the 19th century, in Britain. Most were homemade, with chalk Pulverized brick, or salt as ingredients. An 1866 Home Encyclopedia recommended Purlverized charcoal, and cautioned that many Patented toothpowders that were commercially marketed did more harm than good.

Arm and Hammer marked a baking soda-based toothpowder in the united States until approximately 2000, and colgate currently markets, tooth powder in India and other countries.

Modern toothpaste :- An 18th century American and British toothpaste reciepe called for the burned bread. Another formula around this time called for dragon's blood (a resin) a cinnamon, and burned alum.

By 1900, a paste made of hydrogen peroxide and baking soda was recommended for use with toothbrushes. Pre-mixed toothpastes first marketed in the 19th century, but did not surpass the popularity of toothpowder ~~until~~ until World war I.

Together with willoughby. D. Miller, Newell Sill jekins developed a toothpaste containing disinfectants. The name's origin is from Greek. kolyonosos. meaning 'disease Prevention.' Numerous attempts to produce the toothpaste by pharmacists in Europe have been uneconomic After returning to the. US. he continued. experimenting with Harry ward Foote (1875-1942), Proffessor of Chemistry at Sheffield Chemical laboratory of yale University. After 17 years of development of kolynos and clinical frails, jenkin retired and transfered the production and distribution to his son. Leonard A. jenkins, who brought the first tooth paste tubes on the market on April 13. 1908. within a few years the company expanded in North America.

Fluoride was first added to toothpastes in the 1890's, Tangara containing Calcium fluoride as the active ingredient Was sold by Karl F. Tollner Company, of Bremen, Germany based on the early works of chemist. Albert Deninger. An analogous. invention by by Roy Cross. of Kanas City, Missouri, was initially criticized by the American Dental Association (ADA) in 1937. In 1980 the Japanese Company, Sangi. Co. Ltd, launched APADENT, the world's first remineralizing toothpaste to use a nano-form of hydroxyapatite, the main Component of tooth enamel rather than fluoride, to remineralize areas of minerals loss below the Surface of tooth enamel it's hydroxyapatite. ingredents was approved as an. active anti-caries. agent by the japanese ministry of helth in 1993, and given the name medical. Hydroxyapaltie, to distinguish it from othera forms. of hydroxyapaltie used in toothpaste, Such as dental abrasives.

MKR Govt. Degree College

Devarakonda [Dist] Nalgonda

Department of Chemistry

Project work

Discoveries in the field of Chemistry?

[1990 - 2021]

Guided by
M.Alivel
(Dr. M. Alively)
Asst. Professor of Chemistry

Discoveries in the field of Chemistry ?
[1990 - 2021]

1990 - 1991

Sumio Iijima uses electron microscopy to discover a type of cylindrical fullerene known as a Carbon nanotube, though earlier work had been done in the field as early as 1951. This material is an important component in the field of nanotechnology.

1994

-First total Synthesis of Taxol by Robert A. Holton and his group.

1995

Eric Cornell and carl wieman produce the first Bose - Einstein Condensate, a Substance that displays quantum mechanical properties on the macroscopic Scale.

The discovery of the 118 chemical elements known to exist as of 2021 is presented in chronological order.

Modern discoveries

Z	Element	observed /predicted		Isolated[widely known]	Notes
			By	By	
110	Darmstadtium	1994	S.Hofmann et al. [GSI in Darmstadt]		Prepared by bombardment of lead with nickel.
111	Roentgenium	1994	S.Hofmann et al. [GSI in Darmstadt]		prepared by bombardment of bismuth with nickel.
112	Copernicium	1996	S. Hofmann et al. [GSI in Darmstadt]		prepared by bombardment of Lead with Zinc .
114.	Flerovium	1998	Y. Oganessian et al. [JINR in Dubna]		prepared by bombardment of plutonium with calcium.

Z	Element	Observed/predicted		Isolated [widely known]		Notes
			By		By	
116	Livermorium	2000	Y. Oganessian et al. [JINR in Dubna]			Prepared by bombardment of Curium with calcium.
118	Oganesson	2002	Y. Oganessian et al. [JINR in Dubna]			prepared by bombardment of Californium with calcium.
115	Moscovium	2003	Y. Oganessian et al. [JINR in Dubna]			Prepared by bombardment of americium with calcium.
113	Nihonium	2003-2004	Y. Oganessian et al. [JINR in Dubna] & K. Morita et al. [Riken in wako, Japan]			Prepared by decay of moscovium by Oganessian's team and bombardment of bismuth with Zinc by Morita's team.
117	Tennessine	2009	Y. Oganessian et al. [JINR in Dubna]			Prepared by bombardment of barkelium with Calcium.

Nobel Prize in Chemistry 1990

The Nobel prize in chemistry is awarded annually by the Royal Swedish Academy of Sciences to Scientists in the various fields of chemistry.

- The Nobel prize in chemistry 1990 was awarded to Elias James corey " for his development of the theory and methodology of organic Synthesis ".

- Richard Robert Ernst [14 August 1933 - 4 June 2021] was a Swiss physical chemist and Nobel Laureate.

Known for :- Ernst angle
fourier transform NMR Spectroscopy
2D NMR
Spectroscopy / Nuclear overhauser effect
Spectroscopy / Exclusive correlation
Spectroscopy
3D NMR Spectroscopy.

Awards :- Nobel prize for chemistry [1991]
wolf prize in chemistry [1991]
Louisa Gross Horwitz prize [1991]
ForMemRs [1993]

Ernst was member of the world knowledge Dialogue Scientific Board. He was also awarded The Tradeus Reichstein medal in 2000 and the order of the Star of Romania in 2004 He also held Honorary Doctorates from the Technical university of Munich, EPF Lausanne, university of Zurich, University Antwerpen, Babes - Bolyai university and university Montpellier The 2009 Bel Air film festival featured the world premiere of a documentary film on Ernst Science plus Dharma Equals Social Responsibility. produced by Carlo Burton, the film takes place in Ernst's hometown in Switzerland.

All Nobel Prizes in Chemistry

[1990-2021]

* The Nobel Prize in Chemistry 1990

"Elias James Corey" for his development of the theory and methodology of Organic chemistry synthesis".

* The Nobel Prize in chemistry 1991

Richard R. Ernst "for his Contributions to the development of the methodology of high resolution nuclear magnetic resonance [NMR] Spectroscopy".

* The Nobel Prize in Chemistry 1992

Rudolph A. Marcus " for his Contributions to the theory of electron transfer reactions in chemical Systems".

* The Nobel Prize in Chemistry 1993

" for Contributions to the developments of methods with in DNA-based chemistry".

Kary B. Mullis " for his invention of polymerase chain reaction [PCR] method".

Michael Smith "for his fundamental contributions to the establishment of oligonucleotide - based, site - directed mutagenesis and its development of protein studies".

*» The Nobel Prize in chemistry 1994

George A. olah " for his contribution to carbocation chemistry".

*» The Nobel Prize in Chemistry 1995

Paul J. Crutzen, Mario J. Molina and F. Sherwood Rowland " for their work in atomaspheric chemistry, particularly Concening the formation and decomposition of ozone".

*» The Nobel Prize in Chemistry 1996

Robert F. Curl Jr., Sir Harold W. Kroto and Richard E. Smalley " for their discovery of fullerenes".

*» The Nobel Prize in chemistry 1997

Paul D. Boyer and John E. walker " for their elucidation of enzymatic mechanism underlying the Synthesis of adenosine triphosphate [ATP]"

Jenus C. Skou " for. the first discovery of an ion - transporting enzyme, Na^+, K^+ - ATPase".

*→ The Nobel Prize in chemistry 1998

Walter kohn " for his development of the density of functional theory".

John A. Pople " for his development of Computational methods in quantum chemistry "

*→ The Nobel Prize in chemistry 1999

Ahmed H. Zewail " for his studies for the transition states of chemical reactions using femtosecond Spectroscopy"

*→ The Nobel Prize in chemistry 2000

Alan J. Heeger, Alan G. Mac Diarmid and Hideki Shirakawa " for the discovery and development of Conductive polymers "

*→ The Nobel Prize in Chemistry 2001

William S. knowles and Ryoji Noyori "for their work on chirally catalysed hydrogenation reactions"

K. Barry Sharpless " for his work on chirally catalysed oxidation reactions".

** The Nobel prize in chemistry 2002

"for the development of methods for identification and Structure analyses of biological macromoleccules"

John B. fenn and Koichi Tanaka "for their development of Soft desorption ionisation methods for mass Spectrometric analyses of biological macromoleccules".

Kurt Wuthrich "for his development of nuclear magnetic resonance Spectroscopy for determining the three-dimensional Structure of biological macromoleccules in Solution"

** The Nobel Prize in Chemistry 2003

"for discoveries concerning channels in Cell membranes"

Peter Agre "for the discovery of water channels"

Roderick MacKinnon "for Structural and mechanistic Studies of ion channels".

** The Nobel Prize in Chemistry 2004

Aaron Ciechanover, Avram Hershko and Irwin Rose "for the discovery of ubiquitin-mediated protein degradation"

** The Nobel Prize in Chemistry 2005

Yves Chauvin, Robert H. Grubbs and Richard R. Schrock "for the development of the metathesis method in Organic Synthesis".

** The Nobel prize in chemistry 2006

Roger D. Kornberg " for his studies of the molecular basis of eukaryotic transcription".

* The Nobel prize in Chemistry 2007

Gerhard Ertl " for his studies of chemical processes on Solid Surfaces".

* The Nobel prize in Chemistry 2008

Osamu Shimomura, Martin Chalfie and Roger Y. Tsien "for the discovery and development of the green fluorescent protein, GFP".

* The Nobel prize in chemistry 2009

Venkatraman Ramakrishnan, Thomas A. steiz and Ada E. Yonath "for studies of the structure and function of the ribosome".

** The Nobel prize in Chemistry 2010

Richard F. Heck, Ei-ichi Negishi and Akira Suzuki " for Palladium catalyzed cross couplings in organic Synthesis"

** The Nobel prize in chemistry 2011

Dan shechtman " for the discovery of quasicrystals"

* The Nobel Prize in chemistry 2012

Robert J. Lefkowitz and Brain K. Kobilka "for studies of G-protein-coupled receptors"

* The Nobel prize in chemistry 2013

Martin Karplus, Michael Levitt and Arieh Warshel "for he development of multiscale models for complex chemical systems".

* The Nobel Prize in chemistry 2014

Eric Betzig, Stefan W. Hell & William E. Moerner "for the development of Super-resolved fluorescence microscopy".

* The Nobel Prize in chemistry 2015

Tomas Lindahl, Paul Modrich and Aziz Sancar "for mechanistic studies of DNA repair"

* The Nobel prize in chemistry 2016

Jean-Pierre Sauvage, Sir J. Fraser Stoddart and Bernard L. Feringa " for the design and Synthesis of molecular machines".

* The Nobel Prize in chemistry 2017

Jacques Dubochet, Joachim Frank and Richard Henderson " for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in Solution".

** The Nobel Prize in Chemistry 2018

Frances H. Arnold " for the directed evolution of enzymes".

George P. Smith and Sir Gregory P. winter "for the phage display of peptides and antibodies"

** The Nobel Prize in Chemistry 2019

John B. Goodenough, M. Stanley whittingham and Akira Yoshino "for the development of Lithium-ion-batteries".

** The Nobel Prize in Chemistry 2020

Emmanuellae Charpentier and Jennifer A. Doudna "for the development of a method for genome editing".

** The Nobel Prize in Chemistry 2021

Benjamin List and David Mac Millan "for the development of asymmetric Organocatalysis".

Scope of award

In recent years, the Nobel prize in chemistry has drawn criticism from chemists who feel that the prize is more equently awarded to non-chemists than to chemists.

In the 30 years leading upto 2012, The Nobel Prize in Chemistry was awarded ten times for work classified as Biochemistry or molecular biology, and once to a materials Scientist. In the ten years leading upto 2012, only four prizes were awarded for work strictly in chemistry. Commenting on the Scope of the award, The Economist explained that the Royal Swedish Academy of Sciences is bound by Nobel's bequest, which Specifies awards only in physics, chemistry, literature, Medicine, and peace. Biology was in its infancy in Nobel's day and no award was established.

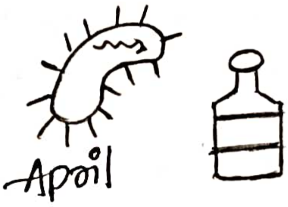
The Economist argued there is no Nobel prize for mathematics either, another major discipline, and added that Nobel's Stipulation of no more than three winners is not readily applicable to moden through huge physics, where progress is typically made through huge collaborations rather than by Individuals alone.

Events in the field of chemistry in 2020

chemical events, that 2020 has brought us

January

A Telescope that Brings us Closer to the Sun



April

plastic - Eating bacteria

Zeptosecond

October

- * The Nobel Prize
- * zeptoseconds

March

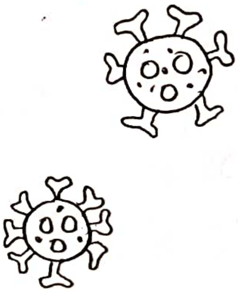
A year marked by the Covid-19 pandemic

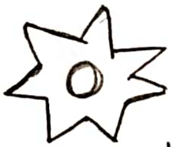
July

- * A way to cut 2D materials
- * Metal-Eating Bacteria
- * Almost invisible fish

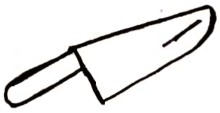
November

- * The polish Nobel prize
- * Diamonds made in minutes



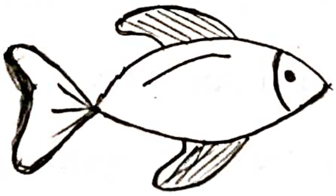


Polish Nobel Prize



A way to cut 2D materals

Diamonds made in minute



Almost invisible fish

Metal-Eating Bacteria

1. A Telescope that Brings us closer to the Sun

[January 2020]

A telescope that made it possible to capture extremely detailed pictures of the Sun has been built in Hawaii by National Science foundation [NSF], as US government agency. It is the world's largest telescope and has a 4-metre solar mirror. The pictures it takes has creatid a new era in the study of the Sun. It will enable weather forecasters to predict geomagnetic storms more accurately and better understand what affects cosmic weather

Telescope

2. A year marked by the Covid-19 Pandemic [March 2020]

Even though the first Covid-19 cases was observed in Novembe 2019, the world Health Organisation labelled it as a pandemic on 11 March 2020. The disease caused by the SARS-Cov-2 Virus shook the whole world. An important weapon role has been played by chemicals such as disinfectants, which proved to be an important weapon in the fight against the spread of the disease. The chemical industry also took an important role in the medical and pharmaceutical sectors by supporting doctors in their fight against the disease.

FIELD WORK SUBMITTED

To

THE CHEMISTRY DEPARTMENT,
MKR GOVERNMENT DEGREE COLLEGE, DEVARAKONDA

On

"DETECTION OF FOOD ADULTERANTS"

Supervised by

Dr. M. ALIVELU

Asst Professor of Chemistry,

MKR Govt. Degree College,

DEVARAKONDA

CERTIFICATE

This is to certify that the following mentioned students of MKR Govt. Degree College, Devarakonda, Nalgonda (dt) have done the group project in Chemistry with title: **'DETECTION OF FOODADULTERANTS'** under the supervision of Dr. M. Alivelu, Assistant professor of Chemistry of this college and submitted the same to the department of Chemistry, MKR GDC Devarakonda.

S. No	Regd. No of the student	Name of the student	Course
1	19044026468001	ABBANABOINA JITHENDAR	M.P.CS E/M, Sem IV
2	19044026468002	AERRA AJAY KUMAR	M.P.CS E/M, Sem IV
3	19044026468004	ALIMINETI PREMALATHA	M.P.CS E/M, Sem IV
4	19044026468005	ARUKALA SHIVA	M.P.CS E/M, Sem IV
5	19044026468006	AVULA ANJALI	M.P.CS E/M, Sem IV
6	19044026468007	BODA SURESH	M.P.CS E/M, Sem IV

M. Alivelu

Signature of the Superviser

Signature of the Principal

PRINCIPAL (FAC)
M.K.R. Government Degree College,
Devarakonda, Nalgonda. Dt. 508248

CONTENTS

1. INTRODUCTION:

The Objective of this project is to study some of the common food adulterants present in different food stuffs.

Adulteration in food is normally present in its most crude form; prohibited substances are either added or partly or wholly substituted. Normally the contamination/adulteration in food is done either for financial gain or due to carelessness and lack in proper hygienic condition of processing, storing, transportation and marketing. This ultimately results that the consumer is either cheated or often become victim of diseases. Such types of adulteration are quite common in developing countries or backward countries. It is equally important for the consumer to know the common adulterants and their effect on health.

The increasing number of food producers and the outstanding amount of import foodstuffs enables the producers to mislead and cheat consumers. To differentiate those who take advantage of legal rules from the ones who commit food adulteration is very difficult. The consciousness of consumers would be crucial. Ignorance and unfair market behavior may endanger consumer health and misleading can lead to poisoning. So we need simple screening, tests for their detection. In the past few decades, adulteration of food has become one of the serious problems. Consumption of adulterated food causes serious diseases like cancer, diarrhea, asthma, ulcers, etc. Majority of fats, oils and butter are paraffin wax, castor oil and hydrocarbons. Red chilli powder is mixed with brick powder and pepper is mixed with dried papaya seeds. These adulterants can be easily identified by simple chemical tests.

Several agencies have been set up by the Government of India to remove adulterants from food stuffs. Selection of wholesome and non-adulterated food is essential for daily life to make sure that such foods do not cause any health hazard. It is not possible to ensure wholesome food only on visual examination when the toxic contaminants are present in ppm level. However, visual examination of the food before purchase makes sure to ensure absence of insects, visual fungus, foreign matters, etc.

1.1 SOME ADULTERANTS IN COMMON FOOD

Majority of adulterants used by the shopkeepers are cheap substitutes easily available. For example, adulterants in fats, oils and butter are paraffin wax, castor oil and hydrocarbons. Read chili powder is mixed with brick powder, turmeric powder is mixed with yellow lead salts and pepper is mixed with dried papaya seeds. Similarly sugar is contaminated with washing soda and other insoluble substances, milk is adulterated with starch, argemone oil is used to adulterate mustard oil, vanaspati ghee is mixed with deshi ghee, beson is mixed with khesari dal etc. These type of adulterants makes a food stuff inferior.

1.2 IMAPACT OFADULTERANTS

Every day we hear and watch live on television sets how the food items are being adulterated and this spurious, unhygienic and harmful food is entering our houses. We have seen how milk and milk products are being made from urea, soap and other harmful chemicals. We all know that vegetables are being given injections to make them grow faster and overnight. The other day we saw how steroids were being injected to chickens to make them into a hen in a very short span of time. We have also come across evidence as to how the fruits are being ripened with the use of harmful chemicals.

Adulteration of food causes several heath problems in humans. Some of the health hazards include stomach ache, body ache, anemia, paralysis, and increase in the incidence of tumors, pathological lesions in vital organs, abnormalities of skin and eyes. Hence food adulteration should be given great importance due to its effect in the health significance of the public. The people are suffering from heart disease, kidney failure, skin diseases, asthama and other chronic diseases. The people are hapless victims of this adulteration industry running in full swing and unchecked.

1.3 DIFFERENT CHEMICAL TESTS FOR DETECTION OF ADULTRANTS

Food adulteration has now become a burning problem. The adulterants used are so similar to natural foodstuffs that it becomes very difficult for a common man to detect them. A few simple tests can be done to detect adulterants found in common foodstuffs.

Metanil yellow in pulses:

Shake 5 gms of the suspected pulses with 5 ml of water. Add a few drops of hydrochloric acid. A pink colour shows the presence of metanil yellow.

Kesari Dal in Chana or Other Dals:

Add 5 ml of normal hydrochloric acid to a small quantity of dal in a glass. Keep the glass in simmering water for 15 minutes. Development of pink colour indicates the presence of Kesari dal. By visual detection-shape of dal. The kesari dal is wedge shaped.

Water in milk:

Measure the specific gravity with a lactometer. The normal values will fall between 1.030 and 1.034. Milkmen are wise to the test and may dilute the milk only to the right density, so this is only a rough test.

Starches in milk:

Add a drop of iodine solution to a small quantity of milk. Milk containing starch turns blue. Pure milk turns a coffee shade.

Vanaspati in pure ghee:

Take about one teaspoonful of melted butter with an equal quantity of concentrated hydrochloric acid in a test tube. Add 2 or 3 drops of furfural solution. Shake it well for one minute and let it stand for five minutes.

Appearance of pink colour in the lower layer of acid means that vanaspati is present in pure ghee/butter as an adulterant.

Argenone oil in mustard oil:

Heat the mixture of oils with a little amount of nitric acid for two to three minutes. A red colour will appear if argemone is present.

Chalk or any other dust or dirt in sugar:

Dissolve sugar in water, the impurities will settle down at the bottom. Etc.

2. METHODOLOGY:

2.1 Detection of Starch in Milk

Along with water, a very common adulterant of milk is starch. milk consist of three basic components which are water(about 80%0), fat(about 3.5%) and solids containing protein, lactose and mineral matters(about 8.5%). Milk is adulterated with starch to maintain the thickness of fat extracted milk or diluted milk. The presence of starch can be detected by adding iodine solution to milk.

Reagent used- Iodine solution or tincture of iodine.

Procedure- At first 5mL of milk ample is taken in a test tube and is boiled for 3-4 minutes. Then it is cooled and 1-2 drops of iodine solution is added to it and is shaked well.

Detection- Appearance of blue colour indicates the presence of starch in the sample.

Table for different samples-

S. NO	SAMPLES	RESULT
1.	Amul TAZA	Adulterant absent.
2.	Diary milk	Adulterant present.
4.	Vijaya Dairy milk	Adulterant absent.

2.2 DETECTION OF YELLOW DYE IN TURMERIC POWDER

Turmeric (haladhi) powder is a popular natural dye used in cooked food. The powder is oftenadulterated with rice powder,besan,wheat powder etc. which makes the colour of the turmeric pale. To make the colour bright, often lead chromate, which is a poisonous chemical or coal tar dye is added to turmeric powder.

A.DETECTION OF LEAD CHROMATE

Reagents: Con. HCL and 1% Diphenyl carbazide in rectified spirit.

Procedure: 1g of the turmeric powder sample is taken in a test tube and 5ml of concentrated HCL is added to it.The mixture is shaked thoroughly.Now 1ml of 1% diphenyl crbazide reagent is added.

Detection: Appearance of pink to red colour indicates the presence of lead chromate, $PbCrO_4$, in the sample.

B. DETECTION OF COAL TAR DYE

Reagents: Concentrated HCL and petroleum ether (40-60^0 C).

Procedure: 5g of the sample is taken in a test tube and 10 mL petroleum ether is added to it. The mixture is shaked vigorously and is allowed to stand. 5 mL of conc.HCL is added and is again shaked thoroughly.

Detection: The aqueous acid becomes pink to red in colour if coal tar is present.

Table for different samples

S.NO.	SAMPLES	RESULT
1.	MDH Haldi powder	Adulterant absent.
2.	Open sample	Adulterant present.
3.	Bharat haldi	Adulterant absent.

2.3. DETECTION OF WASHING SODA, CHALK POWDER AND WATER INSOLUBLE SUBSTANCE IN SUGAR

Chalk powder is a water insoluble substance which is often used as a common adulterant in sugar. Moreover sugar is usually contaminated with washing soda.

Detection of various insoluble substances

Reagent: concentrated H_2SO_4, alcoholic solution of α-naphthol, dil HCl.

Procedure: A small amount of sugar is taken in a test tube and is shaked it with little water. Pure sugar dissolves in water but insoluble impurities do not dissolve.

Detection: Insoluble substances appear at the bottom of the test tube if they are present.

Detection of chalk powder, washing soda

Reagent: dil. HCl

Procedure: To a small amount of sugar taken in a test tube, a few drops of dil. HCl is added and observed.

Detection: Brisk effervescence of CO_2 shows the presence of chalk powder or washing soda in the given sample of sugar.

Table for different samples

S.NO.	SAMPLES	RESULT
1.	Open sample	Adulterant present.
2.	Packed sample	Adulterant absent.

2.4 DETECTION OF RED COLOURED LEAD SALTS IN CHILLI POWDER.

Chilli powder often adulterated with red are coloured lead salts and brick powders.

Reagents: Dil. HNO_3, KI.

Procedure: To a sample of chilli powder dil.HNO_3 is added. The solution is filtered and a few drops of potassium iodide solution is added to the filtrate.

Detection: Yellow ppt. indicates the presence of lead salts in chilli powder and insoluble substances indicates the presence of brick powder in the sample.

Table for different samples

S.NO.	SAMPLES	RESULT
1.	Ashirvad Chilli powder	Adulterant present.
2.	. Open chilli powder	Adulterant present.

2.5 DETECTION OF KHESARI DAL IN BESON

Beson powder is usually adulterated with khesari dal which contains butyl oxalyl alanine amine (BOAA) which causes lethargy and ultimate paralysis in lower limbs of human body on regular consumption. The detection of BOAA in beson powder indicates adulteration of it with khesari dal.

Reagents: dil. HCl.

Procedure: To 1g of the beson sample is taken in a test tube and 10 mL of 70% HCl is added to it. The content is boiled for some time.

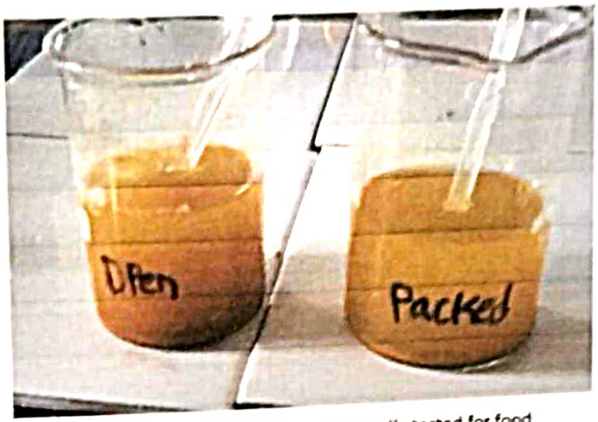
Detection: Development of pinkish colour indicates adulteration of bason with khesari dal.

Table for different samples

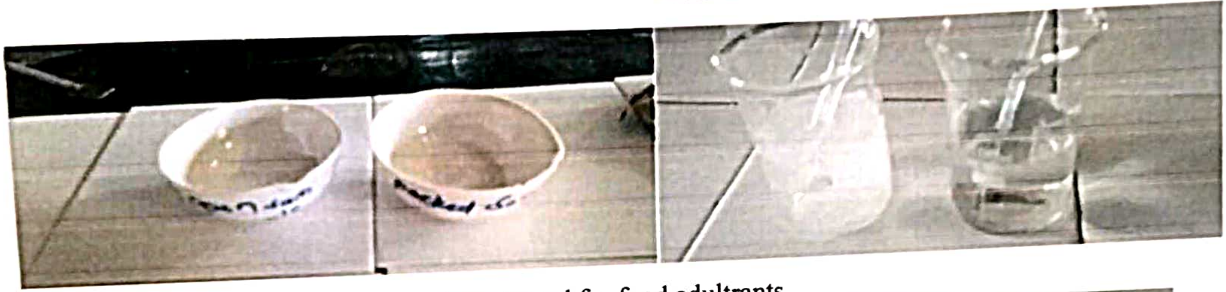
S.NO.	SAMPLES	RESULT
1.	Open sample	Adulterant present
2.	Packed sample	Adulterant present.

Different milk samples were chemically tested for food adulterants.

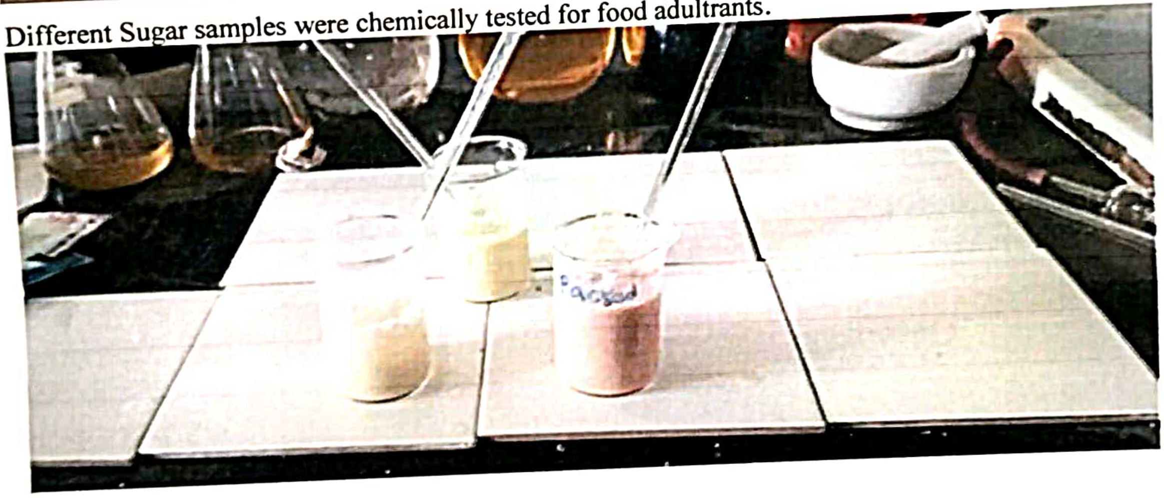
Different Chilli powder samples were chemically tested for food adultrants



Different Haldi powder samples were chemically tested for food adultrants.



Different Sugar samples were chemically tested for food adultrants.



Different Besan samples were chemically tested for food adultrants.

3. CONCLUSION

Different chemical reactions studied involving in the process of detection of different adulterants in different food items. These experiments were performed for the purpose of detecting various adulterants present is common food. The results obtained during these experiments have been shown in this project. The experiments have been performed by common laboratory methods. Packed samples are far better than open samples as in open samples, possibility of contamination with food adulterants is more.

4. Suggestions:

1. At the time of food purchase consumer needs thorough examination and it can be of great help.
2. Label declaration on packed food is very important for knowing the ingredients and nutritional value. It also helps in checking the freshness of the food and the period of best before use.
3. The consumer should avoid taking food from an unhygienic place and food being prepared under unhygienic conditions.
4. It is always better to buy certified food from reputed shop.

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2. Elements Of Practical Chemistry, SUDARSAN BARUAH, Department of Chemistry, Cotton college, Guwahati.
3. Senior Secondary Practical Chemistry, Dr. KAMALESH CHOUDHURY, Dr. SATYENDRA KUMAR CHOUDHURY, Cotton College Guwahati.

PRINCIPAL
MKR Govt. Degree College
DEVARAKONDA, NALGONDA DIST.

ATTENDANCE FOR FOOD ADULTRATION FIELD WORK (from 20,22,23,24,26 of July 2021)

IV SEM MPCS E/M 2020-21

S.NO	ROLL NUMBER	NAME OF THE STUDENT	20-07-2021	22-07-2021	23-07-2021 ATTENDANCE	24-07-2021	26-07-2021
1	19044026468001	ABBANABOINA JITHENDAR	A. Jithendar	A. Jithendar	A. Jithendar	A. Jithendar	A. Jithendar
2	19044026468002	AERRA AJAY KUMAR	A. Ajay kumar	A. Ajay kumar	A Ajay kumar	A. Ajay kumar	A Ajay kumar
3	19044026468004	ALIMINETI PREMALATHA	A- PREMALATHA	A-PREMALATHA	A-PREMALATHA	A. PREMALATHA	A-PREMALATHA.
4	19044026468005	ARUKALA SHIVA	A. Shiva	A. Shiva	A. shiva	A. shiva	A. Shiva
5	19044026468006	AVULA ANJALI	A. Anjali	A. Anjali	A. Anjali	A Anjali	A Anjali
6	19044026468007	BODA SURESH	B. SuResh	B. Suresh	B. Suresh	B. Suresh	B. Suresh.
7	19044026468008	DHANAVATH HANUMANTHU	D. Hanumanthu	D Hanumathu	D. Hanumathu	D. Hanumathu	D. Hanumathu.
8	19044026468010	KAPPERA SRISAILAM	K. Srisailam	K. srisailam	K. srisailam	K. srisailam	K. srisailam
9	19044026468012	KETHAVATH YADAGIRI	K. yadagiri	K. yadagiri	K. yadagiri	K. yadagiri	K. yadagiri
10	19044026468013	KODIDALA KIRAN	K. kiran	K. kiran	K. kiran	K. kiran	K. kiran
11	19044026468015	KUKKAMUDI PARASHURAM	K. parashuram	K. parashuram	K. parashuram	K. parashuram	K. parashuram
12	19044026468017	MANAPAKA.SAIHARSHA	M. saiHarsha	M. saiHarsha	M. saiharsha	M. saiharsha	M. saiharsha
13	19044026468018	MUNAVATH SHIVA	M. shiva	m. shiva	m. shiva	m. shiva	M. shiva
14	19044026468019	NADIMPALLY SHIVA	N. shiva	N. shiva	N. shiva	N. shiva	N. shiva
15	19044026468020	NAMPALLY ANIL	N. Anil	N. Anil	N. Anil	N. Anil	N. Anil.
16	19044026468021	NENAVATH PRASHANTH	N. Prashanth	N. Prashanth	N. Prashanth	N. Prashanth	N. Prashanth.
17	19044026468022	NENAVATHU LAKSHMI	N. Laxmi	N. laxmi	N. laxmi	N. laxmi	N. laxmi
18	19044026468023	NIRASANAMENTLA ANIL	N. Anil	N. Anil	N. Anil	N. Anil	N. Anil
19	19044026468024	NUNE MOUNIKA	N. Mounika	N. Mounika	N. Mounika	N. Mounika	N. Mounika
20	19044026468026	PALLE SAIKUMAR	P. Saikumar	P. Saikumar	P. Sai kumar	P. Saikumar	P. Sai kumar

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	19044026468030	SARANGI PUSHPA	S. Pushpa	S. Pushpa	S. Pushpa	S. Pushpa	S. Pushpa.
4	19044026468031	SHAIK NASREEN FATHIMA	SK. Fathima	SK. Fathima	SK. Fathima	SK. Fathima	SK. Fathima
5	19044026468032	SHAIK RAHEEM	SK Raheem	S. Raheem	S. Raheem	S. Raheem	S. Raheem
6	19044026468033	SHAIK SUJAVODDIN	SK. Sujavoddin	SK. Sujavoddin	SK. Sujavoddin	SK. Sujavoddin	SK. Sujavoddin
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STUDENT STUDY PROJECT IN CHEMISTRY

'BACTERIOLOGICAL AND CHEMICAL ASSESSMENT FOR DRINKING WATER QUALITY OF STUDY AREA, DEVARAKONDA'

Submitted to

COMMISSIONERATE OF COLLEGEATE EDUCTION TELANGANA

Hyderabad

Under Jignasa Programme

Submitted by

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UNDER SUPERVISION OF

DR. M. ALIVELU, M.SC., PH.D.

DEPARTMENT OF CHEMISTRY

MKR GOVT.COLLEGE, DEVARAKONDA

DIST: NALGONDA

MKR GOVERNMENT DEGREE COLLEGE

DEVARAKONDA (Dist. NALGONDA) – 508 248

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CERTIFICATE

This is to certify that the following mentioned students of Munagala Kondal Rao Govt. Degree College Devarakonda Nalgonda (Dt) have done the group project in chemistry with title:' **BACTERIOLOGICAL AND CHEMICAL ASSESSMENT FOR DRINKING WATER QUALITY OF STUDY AREA, DEVARAKONDA'** under the supervision of Dr. M. Alivelu, Assistant professor of Chemistry of this college and submitted the same to the Department of Chemistry and CCE Telanaga.

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ate: 31/12/2021

ChRamaRaj
Signature of the Principal

DECLARATION

Ve the students of Munagala Kondal Rao Govt. Degree College are hereby declare that we have one this original research project ourselves under the guidance of Dr. M. Alivelu, Asst. rofessor of Chemistry, MKR, Govt. Degree College, Devarakonda. We declare that the work icorporated is original and same has not been submitted elsewhere for any degree or diploma.

S.No	Regd. No of the student	Name of the student	Course & Year.
1	19044026445010	P. Roja.	BSC – BZC (3rd)
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CONTENTS

'BACTERIOLOGICAL AND CHEMICAL ASSESSMENT FOR DRINKING WATER QUALITY OF STUDY AREA, DEVARAKONDA'

Abstract

The present study confers the chemical quality of groundwater and surface water of Devarakonda region, Telangana State, for drinking and irrigational purposes. Most of the population depends on groundwater for their daily needs especially for drinking, house needs and irrigation purposes. For this reason, borewell and municipal water samples were collected and analyzed for pH, electrical conductivity, total dissolved solids (TDS), total hardness (TH) chloride (Cl^-), sulphate (SO_4^{2-}), fluoride (F^-), calcium (Ca^{2+}), magnesium (Mg^{2+}), sodium (Na^+) and potassium (K^+). The physical and chemical parameters of groundwater in the study area were analyzed and then correlated with those of World Health Organization Standards. All the parameters of Corporation water are correlated with normal range and suitable for drinking water. From the values corporation water seems very good for drinking and other human use. The bore well water seemed a bit advisable for washing or any other purposes though will never be recommended for drinking.

KEY WORDS:, Groundwater quality, Devarakonda region, Drinking, Irrigation.

1. STATEMENT OF THE PROBLEM:

By analyzing the water sample of the region of Devarakonda, want to understand the quality of water used by the people of this region. Water quality refers to the chemical, physical, and biological characteristics of water. The samples were analyzed for parameters like pH, electrical conductivity, dissolved oxygen, total hardness, alkalinity, total dissolved salts, total suspended solids, and chloride. The values of each parameter gave interesting values which were used to determine the quality.

2. AIMS & OBJECTIVES:

1. By analyzing the water sample of the region of Devarakonda, want to understand the quality of water used by the people of this region.

2. The data is used to calculate the water quality index which aids in assessing the quality of groundwater, can help taking necessary steps to regular monitoring.
3. This data would be useful for the researchers, government, and non-governmental organizations to adopt effective planning methods and mitigation measures and aids in the sustainable development of groundwater.

4. INTRODUCTION

Water is an important part of our environment and it is a natural resource for sustaining life and environment. The geology of the area in general comprises of rocks and mountains of Nalgonda district is one of the 33 districts of Telangana state, with a total geographical area of 1,12,077 sq. km . It has a total population of 350.04 Lakhs [1]. The Devarakonda division has 22 Gram Panchayats, 104 revenue villages and 31 Mandals [2]. For Administrative convenience the district is divided into 3 revenue divisions located at Nalgonda, Miryalguda and Devarakonda . The district lies between North latitude area 16.693514, 78920197 forms a part of major basin of Krishna river and discovered by survey they connected with road and telecommunications in the district and division. There were 11 Large and Medium scale industries in Devarakonda division. The division is endowed with minerals like stone, clay, building materials and rocks and lime stone have been discovered in Pedda Adiserlapalli mandal area. As for the agriculture is concerned the main source of irrigation is groundwater being 72.56% of total gross airrigated, whereas surface water irrigation accounts for 27.33% of gross area [3].

5. METHODOLOGY:

1. Extensive review of literature on various methods of water quality analysis.

2. The samples were collected from bore well, and corporation water.
3. The samples were analyzed for parameters like pH, electrical conductivity, dissolved oxygen, total hardness, alkalinity, total dissolved salts, total suspended solids and chloride.

6. FINDINGS AND DATA ANALYSIS:

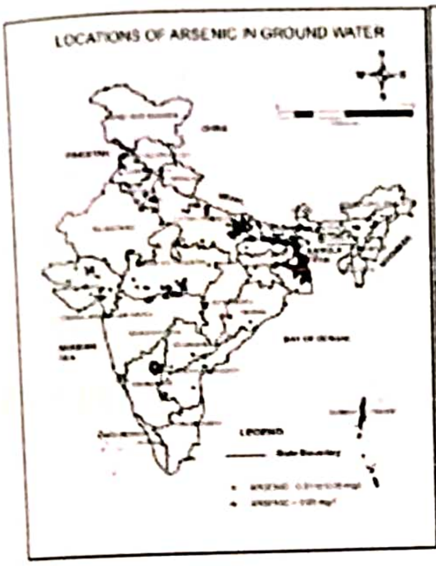
Water quality index (WQI) was determined from the physicochemical parameters like P^H, Electrical conductivity, TDS, total hardness, total alkalinity, sodium, potassium, calcium, magnesium, chloride, nitrate, sulphate, and fluoride. These results are examined with reference to the drinking water quality standards laid down by WHO.

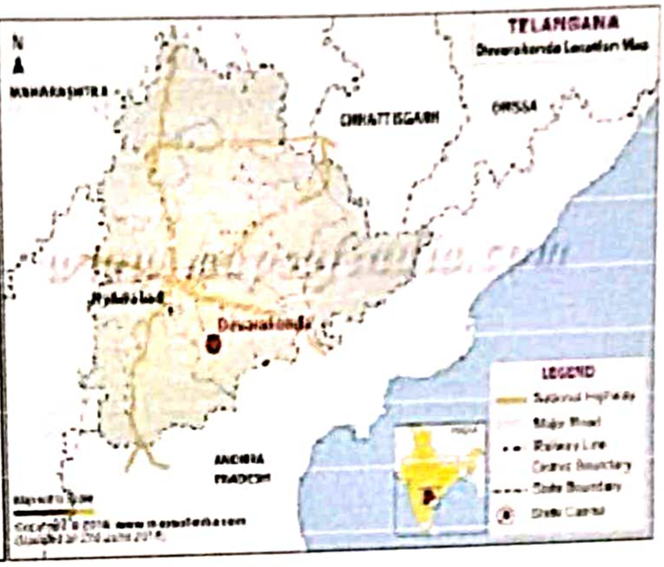
Table 1.

Parameters	Bore Well water	Municipal Tap water	Desirable potable limits as per IS 10500
Dissolved Oxygen (mg/l)	6.2	6.5	6.50
Alkalinity to methyl orange as $CaCO_3$ (mg/l)	288	100	<200
Alkalinity to phenolphthalein as $CaCO_3$(mg/l)	Nill	Nill	-
Non-Carbonate Hardness as $CaCO_3$	12	48	Not specified
Calcium as $CaCO_3$	168	84	<187
Magnesium as $CaCO_3$	132	64	<123
Sodium as $CaCO_3$	105	119	Not specified
Potassium as $CaCO_3$	04	03	Not specified
Sulphate as $CaCO_3$	5918	69	<208
Nitrate as $CaCO_3$	07	03	<36

Flouride (mg/l)	0.32	0.24	<1.00
Total silica as SiO_2	5.6	4.1	Not specified
Iron as Fe	0.02	0.02	<0.3
Colour	Hazen	Colourless	Colourless
Turbidity	1.30	1.20	<5.0
Chloride (mg/l)	95	98	<352
Total Hardness as $CaCO_3$ (Total)	300	148	<300
Electrical Conductivity (µ. Mhos/cm)	818	540	-
P^H	7.04	7.67	6.50-8.50
Total Dissolved Solids (ppm)	532	351	<500
Coli forms	04	Nill	<10
Ecoliforms	Absent	Absent	Not specified
Total Bacterial count	390	160	Not specified

he presence of significant counts of coli form bacteria in the bore well water sources is ndicative of microorganisms in the surface water. Sanitary inspection is used to identify the auses of contamination and the risks of future contamination. The turbidity of water is an mportant parameter as it contributes to the aesthetics of water and leads to its acceptance or ejection for human consumption.





In bore well water dissolved solids are high (532 mg/l). Alkalinity is also high (288 mg/l). Magnesium quantity is 132 mg/l (normal range is below 123). Sulphtes are very high i.e 5918 mg/l (normal range is less than 208 mg/l).

All the parameters of Corporation water are correlated with normal range and suitable for drinking water. From the values, interestingly corporation water seems very good for drinking and other human use. The bore well water seemed a bit advisable for washing or any other purposes though will never be recommended for drinking.

7. CONCLUSION:

The bore well water is of course not advisable for drinking, can be used for washing or any other purposes. These findings demonstrate the need to come up with source water protection strategies for rural communities where water treatment is not available. To this end, keeping the water sources safe by properly constructed fences, regular maintenances and supervisions of water sources and proper disposal of human, and animal wastes are recommended

It was concluded that drinking water sources need to be routinely treated and monitored to eliminate the possible threats to both human and animal health.

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MKR Govt. Degree College

Devarakonda, Dist- Nalgonda

Department of Chemistry

Project work

Environment pollutions form- 2021 - 2022

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ENVIRONMENT

POLLUTION

Title: ENVIRONMENT POLLUTION

* It mean adding impurities to the environment.

* It is an undesirable change in chemical, physical, and biological characteristics of air, water and soil, which causes the health problem to all the living being.

Introduction:

Pollution is the introduction of harmful materials into the environment. Landfills collect garbage and other land pollution in a central location... They can also be created by human activity. such as trash or run off produced by factories. pollutants damage the quality of air. water and land.

* Non-degradable pollutants

* The protection of environment has became a major issure around the global for well being of the people and economic development.

Method :

These are categorised as:

- Air pollution
- Water pollution
- Soil pollution
- Sound / noise pollution

Air pollution :

It can be defined as addition of any contaminant to the air which causes harm to the health of living organisms.

Sources of air pollution:

- It can be classified as
- Air pollution by natural and manmade sources.
- Air pollution by human activities.

Effects of Air pollution:

- Effects on living things.
- Effects on non-living things.

Effects on living things:

Air pollution and human health.

- Irritation of eyes, throat, nose and respiratory system.
- Respiratory damage through tobacco smoke.
- Convulsions, coma due to lead poisoning.
- Cigarette smoking cause cardiovascular diseases due to cadmium particulates.
- Radioactive dust causes genetic effects on the next generation.
- The mercury from combustion of fossil fuel affects the nerves, brain and kidney.

EFFECT ON NON-LIVINGS:

- Effect on metals:
- Corrosions or abrasion of metals
- The acid gases like O_3, SO_2, NO_2 affect the strength of the textile.
- The building material get affected by SO_2 and acid rains
- SO_2 and acid gases affect the quality of paper and leather
- The paints get decoloured by SO_2 and H_2S.

Water pollution:

It can be defined as" the presentce of impurities and foreign substance in water in such a quactity the lowers its quality and makes it unfit for consumption and causes health hazard

or

"Any physical, biological or chemical change in water quality the adversely affects livings organism can be considered pollution.

Causes of water pollution:

* The water gets polluted by various causes and at various sources which are divided as.

* point source - source is identifiable (if pollution comes from single source such as oil spill it is called point source)

* Non-point source- source is not identifiable. (if pollution comes from many soures is called non-point source.)

Effect of water pollation:

* Fertilizers and detergents act as nutrients and helps to grow alage which consumes

dissolved oxygen and biological oxygen demand increase thus kill aqua life.

* oil pollutions spill throught oil tankers get spread over the water creating thin layer over the water surface.
* This affects the water cycle and leads to death of water birds and fishes.

* In general consumption of polluted water causes diseases like typhoid, dysentery, cholera.

Measures to control water pollution:

* Filtration in the process water is allowed to pass through a bed of coares and find sand.
* It removes colour, taste, adour and also bacteria
* These filters may be pressure filters may be pressure filters and gravity filters.

* softening of water, it used to removed the hardsom hardness of water, two methods are used - by boiling water the hardness is removed or by adding lime in the water the hardness can be removed.

SOIL POLLOTION:

Soil pollution is defined as contamination causes by chemicals and other substance resulting in the loss of the fertility or the productivity of soil.

* The productivity of soil its measured in items of the yields of grains per nuit of land.

* The indirect effect of soil contaminated is observed thought the crop contaminated.

* When such contaminated grain are consumed by the human being they effect the human health.

SOURCES OF SOIL POLLUTION:

* polluted water discharge from factories.

* oil and petroleum from vehicles washed off the road by the rain into the surrounding habitat.

* chemicals fertilizer runoff from factories mixing with rain)

* sewage discharged into rivers instead of being treated property.

* over application of pesticides and fertillzers
* purposeful injection into ground water as dispal method.

EFFECTS OF SOIL POLLUTION :

* Agriculture:
* Reduced soil fertility.
* Reduced nitrogen fixation.
* Increased erodiability.
* Larger loss of soil and nutrient.
* Deposition of slit tanks and reservoirs
* Reduced crop yields
* Imbalance in soil fauna and flora.

Industrial:

* Ecological imbalance
* Release of pollutant gases
* Release of radioactive rays causing health
* problems
Incresed salinity

Urban:

* clogging of drains
* public health problems
* pollution of during water sources
* Foul smell and release of gases.

Sound / Noise pollution:

* Noise is unplesant, high intensity-sound.
* Noise which pollute calmness of society is called pollution.

Impotant sources of Noise pollution:

* Industiral activitiest : peneumatic industries, textile industries stell rolling industries, wood cuting mills.
* Transport activities : automobiles railway, aeroplanes
* Domestic activities : T.V. Radia, tape recorder, mixing grinders.
* cultural activites :- Festivals, religious programmes marriage function, publicspeeches.
* Agricultural activity : tractors, threshers
* Mining activity :- blasting
* other activity :- shone crushing

Construction of dams, tunnels, roads, landslides, and earthquake are the nature source of noise pollution.

Effects of Noise pollution:

* The noise pollution creates temprary as well as permaent problem to the human being, the noise pollution can have phyiscal, physicological and psychological effects.

phyiscal effects:

* Temporary hearing problems
* permaent deafiness
* Damage to tympatic membrane.

physicological effects:

* Head in the heart
* Reduction in the vision
* Rise in blood pressure
* Loss of memory.

pschological effects:

* Depression
* fatigure
* Emotional disturbance
* Frustration
* Irritation.

Conclusion:

Enviomental pollution has become a great concern to save our planet. We need to adapt various measures to reduce environment pollution.

Some of them includes planting trees. reducting the use of non-renewable resources proper disposal of water.etc.

It is the responsibilty of every individual to save our environment from geeting polluted.

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PROJECT WORK

Preparation of Ink? from 2021-2022

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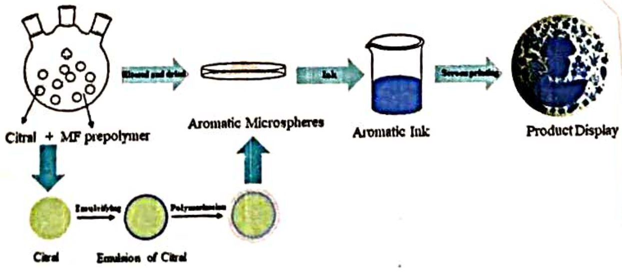
PREPARATION OF INK

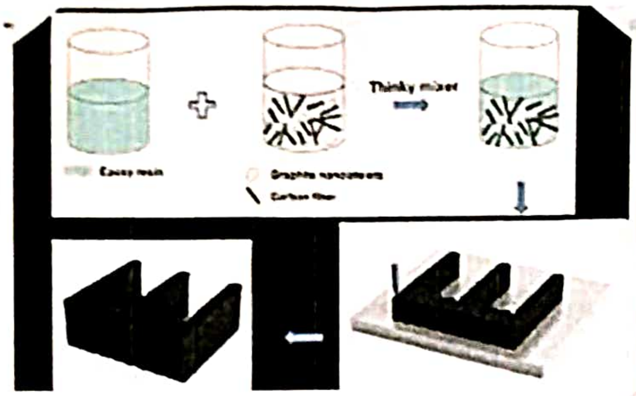
Introduction :-

There's More to ink Than Meets The eye. says Joy kunjiappu There are probaly as Many different definations of ink as There are types. perhaps the simplest description is That ink is a liquid or semi-liquid material used for writing, printing or drawing. chemists view it as a colloidal system of fine pigment particles dispersed in a solvent [chem. Br, February 2003, p28]. The pigment may or may not be coloured, and The solvent may be aqueous or organic. The earliest black writing inks, developed before 2500BC, were suspensions of carbon, usually lampblack, in water stabilised with a natural gum or Materials like egg albumen. Modern ink formulations are rather More complex. In addition to the pigment They contain many other ingredients in varying levels. collectively known as "vechile" These additional ingredients include pH Modifiers, humectants to retard premature draying, polymeric resins to impart binding and allied properties, defoamer/antifoaming agents to regulate foam efficiency.



wetting agents such as surfactants to control surface properties, biocides to inbit the fungal and bacterial growth that lead to fouling, and thickeners or reeology modifiers to control ink application. over 90 per cent of inks are printing inks, in which colour is impactred by pigments rather than the dye used in writing inks. pigments are insoluble, whereas dyes are soluble through sometimes these terms are used interchangeably in commerical literature. ink pigments ink pigments are both inorganic and organic. mostred writing inks are a dilute solution of the red dye eosin.

Blue colour can be obtained with substituted triphenylmethane dyes. many permanent writing inks contain iron sulfate and gallic and tannic acids aswell as dyes. Ball point ink is usually a paste containing 40 to 70 percent dye. most white inks contain titanium dioxide as the pigment, as rutile and anatase in tetragonal crystalline form. However, growing concerns over the known toxicity of heavy metals have led to the Replacement of many inorganic pigments such as chro



In fact the ink industry is the second largest consumer of carbon black. Other inorganic materials such as clays serve as fillers or extenders, which primarily reduces the cost of pigments, though some also improve ink properties. Metallic pigments like aluminium powder (aluminium bronze) and copper-zink alloy powder [gold bronze] are used in novel silver and gold inks. Miscellaneous inorganic pigments provide luminescent and pearlescant effects. The type of printing process -specifically how the ink-distribution rollers are arranged in the printing press. The major classes of printing processes are lithography or the offset process, flexography, gravure printing, screen printing, letters press and digital printing. Clearly, the ink should be a liquid while in the pad and should dry fast on paper. The various printing processes differ in the way the type is impregnated with the ink, although digital printing does not involve movable types. Each process therefore demands an ink that differs in its viscosity and drying efficiency, which is possible by fine-tuning the composition. Inorganic pigments can be easily dispered by applying minimal force but most organic pigments require special size particles for stable.

Preparation :-

The history of chinese inks can be traced back to the 12th century BC, with the utilization of natural plant [plant dyes animal [squid ink], and mineral offset ink based on such materials as graphite that were ground with water and applie with ink brushes. Evidence for the earliest chinase inks, similar to modern ink sticks, is around 256 BC in the end of th warring states period and produced using manual labour from soot and animal glue. About 1,600 years ago, a popula ink recipe was created. The recipe was used for centuries. Iron salts, such as ferrous sulfate (made by treating iron wit sulfuric acid], were mixed with tannin from gallnuts [they grow on trees] and a thickner. when first put to paper, this ink is bluish-black. over time it fades to a dull brown.

Aniline Ink :-

Following substances are mixed for preparing this type of ink:

1) Main-Materials

1) Main Materials :-

Blue-black color - Naphtha blue-black

Blue color - Acid blue, Methylene blue

Red colour - Scarlet red, Eosin

Black colour - Aniline black

Green colour - malachite green

Some aniline-colours are also used in preparing ink which is dissolved directly in water.

(2) Other Materials :-

i) Glue; Gum Arabic [or gum acacia] is dissolved in hot water and This results in a sticky solution. mixing of This in an in solution helps in many ways.

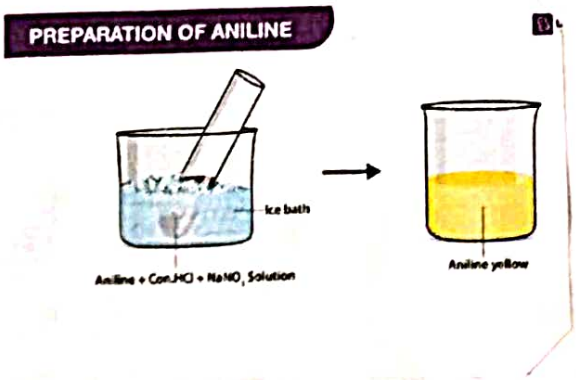
a) The ink turns bright

b) The colour of ink does not fade with time.

c) The flow of ink is maintained smooth.

ii) Glycerine : Sometimes glycerine is also used in preparing ink. The mixing of glycerine checks The early drying of ink this is mainly used in preparing the stamp pad inks.

iii) Alcohol : Spirit or alcohol is mixed in ink because it helps in;



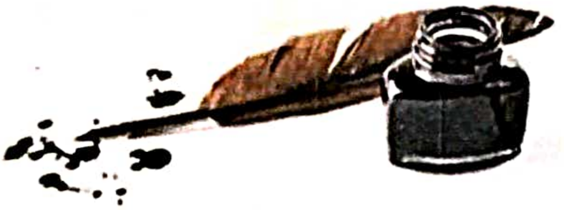
a) Quick drying of ink, and
b) The ink does not diffuse on papers alter writing.

iv) Boric or Carbolic acids: The principal constituents of ink are organic in nature. The breakdown of these material spoils the ink and this causes deposition of constituents in fountain pen of in the ink pot. Incorporation of boric or carbolic acid to the ink preparation checks this problem.

v) Scented materials: The organic decay of ink gives sometimes foul smell. To avoid this, scented materials ar incorporated at the time of ink preparation.

Method of preparing Aniline Ink:-

For preparing a particular colored ink, first of all a 2.5% solution of that colour in distilled water is made.
To this, is added a suitable amount of glue solution.
Now the solution is mixed well and heated for 5 minutes.
During heating the contents are constantly agitated.
On cooling, the solution is filtered. The process of filtration is a very important step and is carefully repeated severtimes.
To this is now mixed a little amount each of boric acid or carbolic acid alcohol or spirit and scented material. This preparation is filtered again and bottled.



Gallo-tannic Ink:-

The following substances are used in its preparations :

1) chief constituents ; Following substances are the chief constituents

i) Tannic and Gallic acids are used as chief constituents to get blue-black ink

ii) Ferrous sulphate and hydrochloric acid also helps in providing blue-black colour to the ink and check the growth fungus.

other materials : The other materials used are carbolic acid or boric acid, gum arabic or gum acacia, spirit or alcoho glycerine and scented material etc. These substances play the same role in this case as in aniline ink. Basically it is mixture of ferrous sulphate tannic acid and Gallic acid, it is therefore also called iron-gall ink.

Method of preparation of Gallo-tannic Ink:-

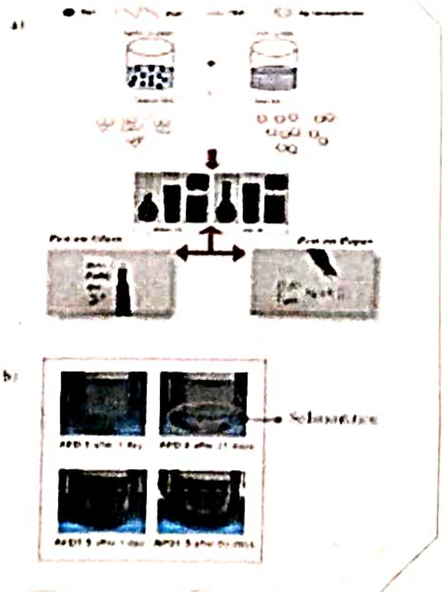
Dissolve 250 gm of tannic acid and 80 gm of Gallic acid in about 5 liters of distilled water. To this solution 250 ml dilute HCl is added.

Dissolve in a separate container 300 gm ferrous sulphate, 20 gm carbolic acid about 4 liters of water. All the in a third container the desired color is dissolved in a little water.

All the three solutions are mixed together. Also add a little of glue solution, alcohol, scented material, mix well, filter and keep the filtrate for a few days. Filter once again and store in bottles. The ink is ready for use.

How to preparing at home Ink!-

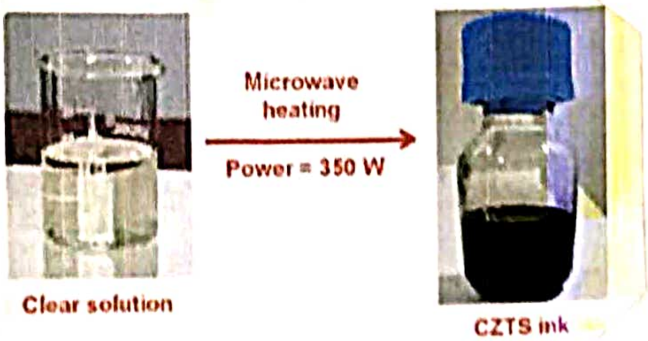
one drop at a time, add hot distilled water to the bowl of lampblack Stop adding water before you think you should and if you accidentally, get too much water add mor lampblack. mix until the water is an inky black once the water is inky black add a small amount of gum Arabic and mix until the gum has been dissolved in the warm liquid store the ink in a small glass bottles for future use. variant of this recipe is mix together one egg yolk, one tablespoon gum Arabic and 1/2 cup honey. Then stir in 1 tablespoon lampblack: this will produce a thick paste which you can store in a sealed container. To use the ink. mix the paste with a small amount of water to achieve the wesired consistency www.google.com.



Health And Enviormental Aspects:-

There is a misconception that ink is non-toxic even if swallowed. once ingested, ink can be hazardous one's health. certain inks, such as those used in digital printers, and even those found in a common pen can be harmful. Though ink does not easily cause death repeated skin contact or ingestion can caus effects such as severe headaches, skin irritation or nervous system.

damage.
Three main enviormental issues with ink are:
→ Heavy metals
→ non-renewable oils
→ volatile organic compounds



Carbon:-

Carbon inks were commonly made from lampblack or soot and
a binding agent such as gum arabic or animal glue. The bin
-ding agent keeps carbon particles in suspension and adhered
to paper. carbon particles donot fade over time even when blea
-ched or when in sunlight. one benefit is that carbon ink
doesnot harm paper.

Iron-gall (common Ink):-

Iron gall inks became prominent in the early 12th century;
They were used for centuries and were widely thought to be
the best type of ink. However, iron gall ink is corrosive and da
-mages paper over time. Items containing this ink can become
brittle and the writing fades to brown. The inorganic scores of
Johann Sebastian Bach are threatened by the destructive prop
-erties of iron gall ink.

Indebile ink:-

Indelible means "unremovable" some types of indelible ink have a very short shelf life because of the quickly evaporating solvents used. India, Mexico, Indonesia, malaysia and other developing countries have used indelible ink in the form of electoral stain to prevent electoral fraud. Election ink based on silver nitrate was first applied in the 1962 Indian general election, after being developed at the National physical Laboratory of India.

The Election commission in India has used indelible ink for many elections. Indonesia used it in its last election in Aceh. In mali, the ink is applied to the fingernail. Indelible ink itself is not infallible as it can be used to commi electoral fraud by marking opponent party members before they have chances to cast their votes. There also reports of "Indelible ink" washing off voters fingers in Afghanistan[28].