Review on Preparation and Characterization of Economic, Organic, and Environmental friendly Soaps from different vegetable oils

Project report submitted for partial fulfilment of the

Degree of Bachelors of Science in chemistry

By

Sanjib Barui (Regn. No.-039034, Roll-2116137 No.-1939182),

Department of Chemistry, Srikrishna College, Bagula

Bagula, Nadia 741502,

West Bengal

~~July~~, 2022

June,

DECLARATION

I hereby declare that the project work entitled "Preparation and Characterization of Economic, Organic, and Environmental friendly Soaps from different vegetable oils" submitted to the department of chemistry, Srikrishna college(Kalyani university) is a record of original work done by me under the guidance of Dr. Nabadyuti Barman, Assistant professor of chemistry, during 3rd March to 8th June, 2022 at Srikrishna college, west bengal.

I also declare that no part of this thesis has previously been submitted to my university or institution for the award of any degree.

Revised by
2/7/22

Place: Bagula

Date: June 8, 2022

Sanjib Barui

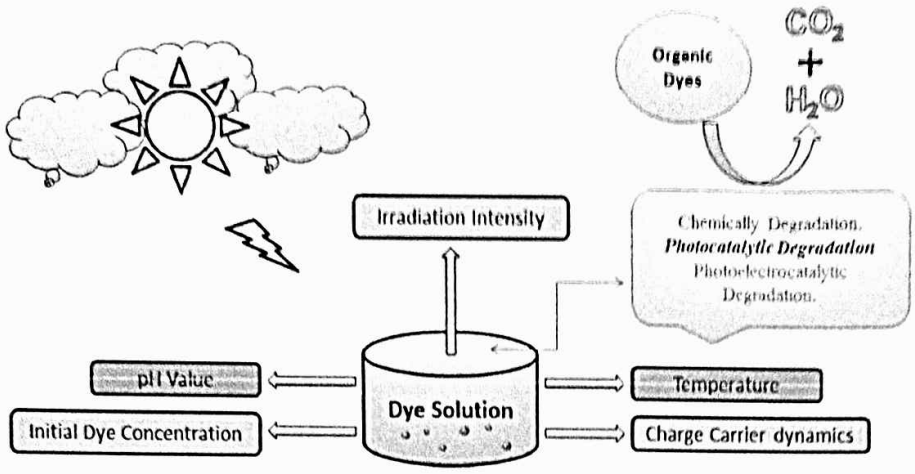
Sanjib Barui

2/07/2022

5. References:

1. The Global Soap and Detergent Market Expands Eco-Friendly Product Lines to Meet Growing Demand; 23rd March, 2021 | Written by IndexBox
2. Lichtenberg, D.; Ahyayauch, H.; Goñi, F.M. "The mechanism of detergent solubilization of lipid bilayers."*Biophysical Journal*. 105 (2): 289–299. (2013). doi:10.1016/j.bpj.2013.06.007
3. Chemical Water Pollution Caused by Every Day Detergents; Updated March 13, 2018 ;By Eric Bagai
4. Nonylphenol, a hazardous chemical present in detergents, is known to enter water bodies and the food ; By Manas Ranjan Senapati; Published: Wednesday 14 July 2021
5. Benefits of Natural Soap - Why Choose Organic, Handmade Soap? ; by Fran C. ;August 08, 2021
6. Molecules:A Journal of Synthetic Chemistry and Natural Product Chemistry ;Multidisciplinary Digital Publishing Institute (MDPI); Natalia Prieto Vidal," Oludoyin Adeseun Adigun, Thu Huong Pham, Abira Mumtaz, Charles Manful Grace Callahan, Peter Stewart, Dwayne Keough, and Raymond Horatio Thomas
7. Advaced practical chemistry (Sixth Edition) by Dr. Subhas C. Das ,2016

Degradation of Harmful Dyes: A Study and An Overview



Roll No - 2116137-1939176
Registration No – 039033
(Under supervision of Dr. Paramita Hajra)

Department of Chemistry
Srikrishna College, Bagula-741502
University of Kalyani

DECLARATION :-

I hereby declare that the Present work "Degradation of Harmful dyes: A Study and an overview" is a record of original work done by us under guidance of Dr. Panamita Hajra, head professor of Srikrishna College, Bagula, West Bengal.

I also declare that no part of this thesis has previously been submitted to my university or any examining body for acquiring any degree.

Place - Bagula.

Date - June 8, 2022.

Rajib Biswas.

Checked by Hajra 07/07/2022

Abstracts:

Dye degradation is a process of broken down of dye into innocuous products where dyes, which are used in different industry and released into ecosystem through water waste. Different traditional wastewater treatment containing dye like chemical, physical and biological processes have been disadvantageous due to high cost, high energy requirement and generation of secondary pollution during treatment process. From last few decades an attracting processes has been growing attention for the decomposition of organic dyes which is advanced oxidation technology. In this processes, the organic matter are oxidized in presence of the light and generation of highly reactive hydroxyl radicals and convert it completely into water, CO_2 and inorganic compounds. In this study we have reviewed different degradation path-way of dyes in aqueous medium and study several degradation parameters.

1. Introduction:

Photocatalytic degradation of dyes or other organic pollutants gain an intensive attention from last few decades where research have been focused not only on their reaction pathways as well as their reaction parameters. [1-7] Most of the dyes are very harmful for humans and other animals but in this industrial era, it is difficult to avoid the usefulness of the dye due to their wide application to colour the products of textiles, rubber, plastics, painting, foods, leather, cosmetics etc. There are different kinds of dyes are available in the markets and they are classified as structure of the molecule component, colour and its method of application. On the basis of their character dyes are basically 2 types, one is natural dyes and other one is synthetic dyes. Natural dyes are 2 types one is plant based dyes and the other one is animal based dyes. Natural dyes are not so harmful for us but the synthetic dyes are mostly harmful for us and our nature. There are 2 types of synthetic dyes like non-azo dyes and azo dyes. Mostly, in textile manufacturing, the dyeing process is used. As well as the synthetic dyes are extensively used in products like clothes, leather accessories, furniture, and plastic products. The increment of % of wastage in environment during the dyeing process is a serious issue today [8]. Since we are unable to avoid the use of dyes, researchers are trying to degrade the waste amount of dyes from industries or laboratories. Usually there are three process for degradation of dyes, (i) chemically, (ii) photocatalytic and (iii) photoelectrocatalytic degradation. Due to the high cost of chemical reagents used in the chemical synthetic process as well as the harmfulness of the chemical reagents is formed as byproducts which may the cause of pollution alternative pathways has been chosen. Fujishima and Honda has discovered electrochemical photolysis of

REFERENCES:

[1] Olga Sacco, Marco Stoller, Vincenzo, Vaiano, Paolo Ciambelli, Angelo Chianese, and Diana Sannino, Photocatalytic degradation of organic dyes under visible light on N-doped TiO2 photo-catalysts, International Journal of Photoenergy, 2012, pp.1-8 (2012Doi:10.1155/20121626759.

[2] M.Z.B. Mukhtish, F. Najnin, M.M. Rahman, and M.J. Uddin, Photocatalytic degradation of different dyes using TiO2 with high surface area: A kinetic study, J. Sci. Res.,2013 5(2) 301-314.

[3] Khan Mamum Reza, A S W Kurney and Fahmida Gulshan, Parameters affecting the photocatalytic degradation of dyes using TiO2: a review, Appl. Water. Sci.,2017 7, 1569-1578, DOI:10.1007/s13201-015-0367-y.

[4] A.K. Khataee and M.B. Kasiri, Photocatalytic degradation of organic dyes in the presence of nanostructured titanium dioxide: influence of the chemical structure of dyes, Journal of Molecular Catalysis A: Chemical, 2010,328, 8-26; DOI:10.1016/j.monicata2010.05.023.

[5] U.G. Akpan and B.H. Hameed, Parameter affecting he photocatalytic degradation of dyes using TiO2 photo-catalysts: A review, Journal of Hazardous Materials, 2009,170, 520-529; DOI:10.1016/jhazmet.3009.05.030.

[6] M.A. Rauf and S. Salman Ashraf, Fundamental Principles and application of heterogeneous photocatalytic degradation of dyes in solution, Chemical Engineering journal, 2009,151,10-18.; doi:10.1016/j.cej 2009.02.026.

[7] M.A. Rauf, M.A. Meetani and S. Hisaidee, An overview on the photocatalytic degradation of azo dyes in the presence of TiO2 doped with selective transition metals, Desalination, 2011,276,13-27;doi:10.1016/j.desal 2011.03.071.

[8] https://en.wikipedia.org/wiki/Industrial_dye_degradation.

[9] Y.B. Xie and X.Z. Li, Interactive oxidation of photo-electrocatalysis and electro-Fenton for azo- dye degradation using TiO2-Ti mesh and reticulated Vitreous carbon electrode, Materials Chemistry and Physics,2006, 95,39-50.

[10] Gylen Odling and Neil Robertson, SILAR BiOI-Sensitized TiO2 Films for Visible-Light Photocatalytic Degradation of Rhodamine B and 4-Chlorophenol, ChemPhysChem, 2017,18, 728 – 735; DOI: 10.1002/cphc.201601417.

[11] R.Nagaraja, Nagaraju Kottam, C.R.Girija and B.M.Nagabhushana, Photocatalytic degration of Rhodamine B dye under UV/solar light using ZnO nano powder synthesized by solution combustion Route, Powder Technology,2012,215-216, 91-97.

NT arranged

Preparation of Conductivity water from tap water through Construction and Modification of a Simple Distillation Unit

Project report submitted for partial fulfilment of the

Degree of Bachelors of Science in

By

Prasanta paul (Roll-2116137 No-1939170 Regn No- 039031)

Department of Chemistry, Srikrishna College, Bagula

Bagula, Nadia 741502

West Bengal

June 2022

DECLARATION

I hereby declare that the present work "Preparation of Conductivity water from tap water through Construction and Modification of a Simple Distillation Unit" is are cord of original work done by us under guidance of Dr. Nabadyuti Barma, Assistant Professor of chemistry Pvt. Ltd, during 3rd march to June 8, 2022 at Srikrishna Collage, west Bengal.

I also declare that no part of this thesis has previously been submitted to my university or any examining body for acquiring any degree.

Revised by
8/7/22

Place: Bagula

Prasanta Paul
02-06-2022
Prasanta paul

Date: June 8, 2022

1. INTRODUCTION

The idea of deionizing water started years ago with the scientists' notion that water is better if it is pure. Deionized water, also known as demineralized water, is water wherein all of its mineral ions such as sodium, iron, calcium, copper, chloride, and sulfate are removed. It is clean, safe. Also, it does not contain any chemicals or harmful toxins.Big manufacturing firms, pharmaceutical companies, and laboratories use deionized water in their experiments and products.One can install a water filter in their home . It can be costly. However, the benefits it gives can outweigh the price. Also, the system is easy to maintain since it only has a few accessories which you need to clean every month.The water filter can be used in other places like hospitals, offices, and schools where the hard water is unsafe for drinking.[1]

Deionization is a chemical process that uses ion-exchange resins, specially manufactured, and exchanges hydrogen and hydroxide ions for the dissolved minerals. Then, it recombines again to form water.The process of deionization can produce highly pure water, which is similar to distilled water since the majority of non-particulate water impurities can dissolve in salt. Also, deionization does not build up the scale, and the process is faster[2].

On the other hand, deionization cannot remove uncharged organic molecules plus the bacteria and viruses, not unless you use incidental trapping in the resin. As such, deionized water can still pose health problems in the end. Furthermore, one can continuously and inexpensively do deionization through electro-deionization[3].

Meanwhile, there are three types of deionization processes:

- **The counter-current -**

  A countercurrent system is characterized by very close contact of arterial blood vessels, ideally capillaries, with venous vessels returning from the tissue. In a fish,swim bladderrete mirabile each arterial capillary is surrounded by several venous capillaries, and vice versa[4].

5. References

1. Mohsen Gavahian, AsgarFarahnaky, Ohmic-assisted hydrodistillation technology: A review, Trends in Food Science &Technology, 72, 2018, 153-161

2. K. Vinothkuumar and R. Kasturibai (2008). 'Performance study on solar still with enhanced condensation'.Desalination, 230, 51–61.[2]

3. G.N. Tiwari, H.N. Singh and Rajesh Tripathi, (2003), 'Present status of solar distillation', Solar Energy 75 pp. 367–373.[3]

4. C. Shen, Ya-Ling He, Ying-Wen Liu and Wen-Quan Tao, (2008), 'Modeling and simulation of solarradiation data processing with Simulink', Journal of Simulation Modeling Practice and Theory, 2, pp. 721-735.[4]

5. Horace McCracken and Joel Gordes, 'Understanding solar stills',1600 Wilson Boulevard, Suite 500Arlington, Virginia 22209 USA[5]

6. M.A.S Malik, G.N. Tiwari, A. Kumar, and M.S. Sodha, (1982) 'Solar Distillation', Pregamon Press, OxfordUK, pp.8–17.[6]

7. K. Sampathkumar, T.V. Arjunan, P. Pitchandi and P. Senthilkumar, (2010), 'Active solar distillation—Adetailed review', Renewable and Sustainable Energy Reviews Vol-14, pp. 1503–1526.[7]

8. Mario Reali and Giovanni Modica, (2008), "Solar stills made with tubes for sea water desalting,"Desalination, 220, pp. 626–632[8]

9. E. Delyannis,(2003), 'Historic background of desalination and renewable energies', Solar Energy, 75,PP.357–366

10. M.A.S. Malik, G.N Tiwari, A. Kumar and M.S. Sodha. "Solar Distillation", Pergamon Press, Oxford, UK, 1982

11. A. Kumar, A. Kumar, G.D. Sootha and P. Chaturvadi," Performance of a multi-stage distillation system

12. using a flat-plate collector", Extended Abstract, ISES Solar World Congress, Kobe, Japan, 1989.

13. Akash BA, Mohsen MS, Osta O and ElayanY ,"Experimental evaluation of a single-basin solar still using

14. different absorbing materials",renewable energy- 14, 1998,307-310.

15. B.B.sahoo, N.Sahoo, P.Mahanta, L.Borbora, P.kalita, " Performance assesment of solar still using blackened

Project report towards the partial fulfilment of B.Sc. degree
Submitted By

Riya Paul
Roll No. 2116137-1939147
Registration No. 039027

Department of chemistry
Srikrishna College Bagula
University of Kalyani Bagula-741502

Srikrishna College, Bagula
University of Kalyani
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

Assistant Prof. Avishek Saha
No .....

BAGULA, 741507, WB, INDIA
KALYANI, 741235, WB, INDIA
Dated:

Certificate

This is to certify that Riya Paul have completed the assignment B.Sc. project work under my supervision within the stipulated period. This project work has been carried out as the practical of CHEMHTDSE-4 in semester VI for the partial of B.Sc. degree, 2022. The title of the project is "TOXIC EFFECTS OF HEAVY METALS"

Avishek Saha
Examination date:

02/7/22

Name and signature of Examiners:

TOXIC EFFECTS OF HEAVY METALS

1. Abstract:

Pollution Caused by heavy metals affect all forms of our life due to the adverse effects it is causing around the world. These inorganic pollutants are being discarded in our waters, soils and into the atmosphere due to the rapidly growing agriculture and metal industries, improper waste disposals, fertilizers and pesticides. This review shows how pollutants enter the environment together with their fate. Some metals affect biological functions and growth while other metals accumulate in one or more different organs causing many serious diseases such as cancer [1] . Toxic levels of heavy metals contamination pose a serious threat to the microorganisms, animal plants and human life.

2.Introduction:

Metallic elements are intrinsic components of the environment. Their presence is considered unique in the sense that it is different to remove them completely from the environment once they enter in it. Metal constitutes an important class of toxic substance which are encountered in numerous occupational and environmental circumstances. The impact of these toxic agents on human health is currently an area of intense interest due to the ubiquity of exposure.

With the increasing use of a wide variety of metals in industry and in our daily life. Problems arising from toxic metal pollution of the environment have assumed serious dimensions.

All these diagnoses should go on to make us aware of the adverse effects that are being caused by these metals, the symptoms that are seen and ways to remove some of the contamination we have from all the heavy metals.

Reference:

[1] Heavy metal pollution in the environment and their toxicological effects on humans [PDF]

[2] Bioinorganic chemistry, A K Das – 2013, 12 chapter, 338

[3] International journal of research – Granthaalayah

[4] S P Banerjee, 2013

[5] Google search automobile resources for toxic effects of heavy metals

[6] Heavy metals accumulation and their toxic effects

[7] Google search fertilizers for toxicity of heavy metals

[8] Bioinorganic chemistry, A K Das – 2013

[9] Google search toxic effects of heavy metals

[10] Journal of biomolecular science

[11] Iranian journal of toxicology, vol 3, Autumn 2010

[12] veterinary world vol 1

[13] Google search lead poisoning

[14] S P Banerjee ,2013

[15] Heavy metal pollution journal.

UNIVERSITY OF KALYANI

B.Sc. HONOURS 6-th SEMESTER

EXAMINATION, 2022

[C.B.C.S.]

Paper Code: CHEM-H-T-DSE-4

PROJECT

"A Mini-Review On Technetium- 99m Labeled Radio- Diagnostic Contrast Agent"

Submitted by,

Soumik Dey

6-th Semester Chemistry (Hons.)

Department of Chemistry,

SRIKRISHNA COLLEGE, BAGULA, NADIA

Roll :- 2116137 No :-1939188 ;

Regn. No :- 039036 ;

Session :- 2019-2020 ;

Project Supervisor :

Dr. Mrinal Kanti Ghosh

Declaration

I hereby declare the present work "A mini review on Technitium - 99m labeled Radio-diagnostic contrast agent" is submitted to our project teacher Dr Mirnal Kanti Ghosh and this record of original work done by us. under guidance of Dr. Mirnal Kanti Ghosh. Srikrishna College, Bagula.

I also declare that no part of this thesis has previously been submitted to My university or, any examining body for aquaring any degree.

Place - Bagula
Date - 03/07/2022

Soumik Dey

M K Ghosh.
02/07/2022

Study on Laboratory based Chemical Waste and their Effects

Dissertation

Submitted for B.Sc. Degree

By

Registration No.- 039032
Roll No.- 2116137-1939175
(Under supervision of Dr. Paramita Hajra)

Department of Chemistry

Srikrishna College, Bagula-741502

University of Kalyani

Abstract:-

Chemicals play an important role in our daily lives, so the use of chemicals infuses modern life. They help us to economic and sustainable development. They can at same time pose significant risk to human health and the environment in the absence of good management practices. Some chemicals can effect on human health and ecological system when released to air, water and soil. Generally we cannot omit them from our daily life so we should learn how to manage them and their wastes. The study mainly focuses on the management of chemical wastes from laboratories as they effect on environment. So we need to gain information about the type of substance in question. Disposal methods will depend upon the properties of each individual residue. For example, acidic and highly toxic bases may in some cases may be neutralized, diluted and discarded (safely). This study mainly described that, the adequate disposal of residual chemicals from laboratories is an important factor in nature preservation, specifically the protection of air and water, soil and forests and the preservation of quality of life. Actually, laboratory chemical waste may impact on the environment and their effect on human health and suggestions for the management of chemical waste.

Introduction:-

The word "Chemical" means a distinct compound or substance especially one which has been purified. Chemicals play an important role in the daily life of mankind. With growing population around the worlds, demand of chemicals increasing everyday. As a result of this fact, factories should enhance producing useful chemicals. The production, transformation or sourcing of any given material generates products of no commercial value, usefulness, or benefit to humans. Those products are referred to as waste. Waste may be classified as hazardous, non-hazardous, active or passive and depending on the classification, may contaminate the ground, water (superficial, underground etc.), air and sediments when improperly discarded. In general, laboratories produce a minimum amount of chemical waste, although the waste they generate is likely to feature some substances that are highly toxic than the industrial chemical waste. The environmental impact caused by teaching and research with regard to chemical waste of increasing concern, and attempts to solve the issue are being made. Generally in educational and research-related institutions where

24. Denzin, K. N.; Lincoln, S. Y. The Discipline and Practice of Qualitative Research. In Handbook of Qualitative Research; Denzin, K. N., Lincoln, S. Y., Eds.; Sage Publications: London, 2005.

25. Yin, R. K. Case Study Research: Design and Methods; Sage Publications: London, 2009.

26. Porlan, A. R.; Martín, J. El Diario del Profesor: Un Recurso para la Investigacion en el Aulá ; Diada: Sevilla, 1998.

27. Projeto Politico Pedagó gico do Curso Té cnico em Quí mica dó Colegio Estadual Dom Joã o Becker; Colegio Dom Joá o Becker: Portõ Alegre, Rio Grande do Sul, Brasil, 2011.

02/07/2021

Assessment of Ground Water Quality in The Locality Of Srikrishna College, Bagula

Project report submitted for partial fulfilment of the

Degree of Bachelors of Science in Chemistry

Ashis Majumder (Roll-2116137 No-1939157),
Reg No. → 039030 of → 2019 - 2020
Department of Chemistry, Srikrishna College

Bagula, Nadia 741502

West Bengal

June → 2022

DECLARATION:

I hereby declare that the present work "Assessment of Ground Water Quality in The Locality of Srikrishna College, Bagula" is are cord of original work done by us under the guidance of Dr. Nabadyuti Barman, Assistant Professor of chemistry Pvt. Ltd, during 3rd March to June 8, 2022 at Srikrishna College, Bagula.

I also declare that no part of this thesis has previously been submitted to my university or any examining body for acquiring any degree.

Revised by
7/7/22

Ashis Majumder
02/07/2022.

Ashis Majumder

Place: Bagula

Date: June 8, 2022

Assessment of Ground Water Quality in The Locality Of Srikrishna College, Bagula

Acknowledgment:

The authors are thankful to the respected professor Dr. Nabadyuti Barman, SKC Bagula.

Abstract:

Water with high concentration of minerals is hard water. Water is essential for life. But water with very High degrees of hardness is harmful to health. Six water samples from different facilities of Srikrishna College are collect and were tested by using EDTA titrimetric method with indicator and electrochemistry (non-indicator) principle. Out of all the samples tested majority of them shows hard character and only single sample water as soft water character. Also from the experiment calcium content has beendetermined. From this study we can know the hardness of any water sample and the ample amount of calcium present in it.

Conclusion :

So from the above experiment in casa of intra study it can be concluded that there is a difference in between all the parameter in respect to all the brands and also in the case of inter study except in Ca^{2+} content for all the other brands having different value. Out of all the samples tested majority of them shows moderately hard character and single sample water as soft water character calcium content has been determined.

Reference :

- Harris DC. 2010. Quantitative Chemical Analysis; 8th Edition; Chapter 11; 7th Edition: Chapter 12.
- WHO /M/26.R1. Determination of hardness of water method. Revised 10 December 1999.
- Ghara A, Si Abhik, Majumder M, Bagchi A, Raha A, Mukherjee P, Pal M, Saha Kr. R, Basu S. 2017. A detailed study of Transition MetalComplexes of a Schiff base with its Physicochemical properties by using an electrochemical method. Asian Journal of Pharmacy and Pharmacology 3(3):86-94.
- S.C Das Practical book [Graduation Level]

9
20

: Very poor work done

* later on have to be revised.
* Relevant methodology is not discussed
* merely a project done

Rearrangement Reactions

Presented By Arpita Biswas

Roll No- 2116137-1939132

Reg No- 039025

Student of B.sc(Honours) 6th Semester

University Of Kalyani

Srikrishna Collage

Department of Chemistry

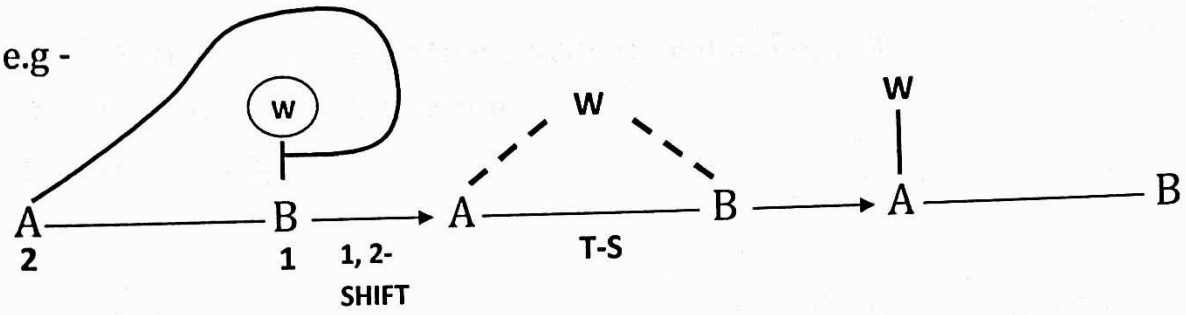
REARRANGEMENT

REACATION

INTRODUCTION:

In a rear angement reaction a group migrates from one atom to another atom in the same molecule and most of migration are 1,2- migration/ 1,2- shifts.

e.g -



- ⇨ W= Migratory Group
- ⇨ A = Migration Terminus
- ⇨ B = Migration origin

- ➢ Migratory group can migrates with electron pair / Nu^- migratory without electron e^- pair, E^+ migratory group migrates with one e^- / Free radical migratory group.
- ➢ Migratory Group migrates most of with e^- pair/ in the form of Nu^- migratory group
- ➢ Among all these 1,2- shifts, Nu^- 1,2- shifts, occurs more commonly.

Types of Rearrangements

a) Rearr to e^- deficient c- atom(Carbonation)

I. Pinacol- Pinacolone Rearrangements
II. Semipinacolone Rearr
III. Benzylic Rearr
IV. Demjanor rearrangements
V. Wolff Rearrangements in Arndt- Eistret Synthesis
VI. Wagner Meerwein rearr
VII. Tiffeneau Demjanor rear

References Baeyer–Villiger Oxidation or Rearrangement

1 Baeyer, V. (1899). Ber. Dtsch. Chem. Ges. 32: 3625–3633.
2 Hassall, C.H. (1957). Org. React. 9: 73–106.
3 Robertson, J.C. and Swelim, A.A.M. (1967). Tetrahedron Lett. 8: 2871–2874.
4 Stoute, V.A., Winnik, M.A., and Csizmadia, I.G. (1974). J. Am. Chem. Soc. 96: 6388–6393.
5 Camps, F., Coll, J., Messeguer, A., and Pericas, M.A. (1981). Tetrahedron Lett. 22: 3895–3896.
6 Ryerson, C.C., Ballou, D.P., and Walsh, C. (1982). Biochemistry 21: 2644–2655.
7 Tobe, Y., Ohtani, M., Kakiuchi, K., and Odaira, Y. (1983). Tetrahedron Lett. 24: 3639–3642.
8 Reeder, A.Y. and Joannou, G.E. (1996). Steroids 61: 74–81.
9 Chandrasekhar, S. and Roy, C.D. (1987). Tetrahedron Lett. 28: 6371–6372.
10 Cullis, P.M., Arnold, J.R.P., Clarke, M. et al. (1987). J. Chem. Soc., Chem. Com mun. 1088–1089.
11 Singh, R.P., Singh, V., Srivastava, J.N., and Bhattacharjee, A.K. (1996). Indian J. Chem., Sect B 35B: 1101–1103.
12 Taschner, M.J. and Black, D.J. (1988). J. Am. Chem. Soc. 110: 6892–6893.
13 Syper, L. (1989). Synthesis 167–172.
14 Camporeale, M., Fiorani, T., Troisi, L. et al. (1990). J. Org. Chem. 55: 93–98.
15 Alcaide, B., Aly, M.F., and Sierra, M.A. (1996). J. Org. Chem. 61: 8819–8825.
16 Lopp, M., Paju, A., Kanger, T., and Pehk, T. (1996). Tetrahedron Lett. 37: 7583–7586.
17 Oh, J. (1997). Tetrahedron Lett. 38: 3249–3250.
18 Strukul, G. (1998). Angew. Chem. Int. Ed. 37: 1198–1209.
19 Roberts, S.M. and Wan, P.W.H. (1998). J. Mol. Catal. B: Enzym. 4: 111–136.
20 Strukul, G. (1998). Angew. Chem., Int. Ed. Engl. 37: 1199–1209.
21 Goodman, R.M. and Kishi, Y. (1998). J. Am. Chem. Soc. 120: 9392–9393.
22 Bolm, C. and Beckmann, O. (1999). Baeyer-Villiger reaction. In: Compre hensive Asymmetric Catalysis I-III, vol. 2 (eds. E. Jacobsen, A. Pfaltz and H. Yamamoto), 803–810. Berlin and New York: Springer.
23 Paquette, L.A., Brand, S., and Behrens, C. (1999). J. Org. Chem. 64: 2010–2025.
24 Renz, M. and Meunier, B. (1999). Eur. J. Org. Chem. 737–750.
25 Crudden, C.M., Chen, A.C., and Calhoun, L.A. (2000). Angew. Chem., Int. Ed. Engl. 39: 2851–2855.
26 Back, T.G., Janzen, L., Nakajima, S.K., and Pharis, R.P. (2000). J. Org. Chem. 65: 3047–3052.
27 Kim, D., Shim, P.J., Lee, J. et al. (2000). J. Org. Chem. 65: 4864–4870.
28 Krasutsky, P.A., Kolomitsyn, I.V., Kiprof, P. et al. (2001). J. Org. Chem. 66: 1701–1707.
29 Kamerbeek, N.M., Moonen, M.J., Van Der Ven, J.G. et al. (2001). Eur. J. Biochem. 268: 2547–2557.

UNIVERSITY OF KALYANI

B.Sc. HONOURS

6TH SEMESTER

EXAMINATION, 2022

[C.B.C.S]

PAPER-CODE : CHEM-H-T-DSE-4

DECLARATION

I hereby declare that the present work "Anti Cancer activity of Different Metal Complexes" is a record of original work done by us under guidance of Dr. Mrinal Kanti Ghosh, Assistant professor of chemitry department at Srikrishna college, Bagula.

I also declare that no part of this thesis has previously been submitted of my University or any examining body for acquiring any degree.

Place : Bagula

Date : June, 2022.

Souham Bhowmick.

M. Ghosh.
24/7/22

PROJECT

"A Mini-Review on Anti-Cancer Activity Of Different Transition Metal Complexes"

Submitted By

Souham Bhowmick

6TH Semester

Chemistry (Hons.)

Department Of Chemistry

Srikrishna College

Roll: **2116137** No.: **1939186**

Registration No.: **039035** Session: **2019-2020**

complexes with distinctly different mechanisms to kill cancerous cells. The huge variety of transition metal properties and ligand combinations has produced an extremely broad spectrum of intercalating anticancer complexes, each with a unique mechanism of action. The continued expansion of this spectrum has great potential to reveal metallointercalators which can outperform current metallodrugs and provide more effective chemotherapy.

4. References :

[1] R.L. Siegel, K.D. Miller, A. Jemal, Cancer statistics, 2018, CA Cancer J. Clin. 68 (2018) 7–30.

[2] https://www.cancercenter.com/what-is-cancer/ (last accessed 15.10.18).

[3] A. "Cancer" World Health Organization. 12 September 2018. https://www.who.int/en/news-room/fact-sheets/detail/cancer (accessed 06/01/2019).

[4] B. Clarke Brian Blackada, Historical review of the causes of cancer, World J. Clin. Oncol. 7 (1) (2016) 54–86.

[5] Hongming Zhang, Jibei Chen, Current status and future directions of cancer immunotherapy, J. Cancer 9 (10) (2018) 1773–1781.

[6] D. Troy, A. Baudino, Targeted cancer therapy: the next generation of cancer treatment, Curr. Drug. Discov. Technol. 12 (1) (2015) 3–20.

[7] E. Jacinta Abraham, John Staffurth, Hormonal therapy for cancer, Medicine 39 (12) (2011) 723–727.

[8] F. Swadesh, K. Das, Mitchell E. Menezes, Shilpa Bhatia, Xiang-Yang Wang,Luni Emdad, Devanand Sarkar, Paul B. Fisher, Gene therapies for cancer: strategies, challenges and successes, J. Cell Physiol. 230 (2) (2015) 259–271.

[9] H. Patrizia Agostinis, Kristian Berg, Keith A. Cengel, Thomas H. Foste, et al., Photodynamic therapy of cancer: an update, CA, Cancer J. Clin. 61 (4) (2011) 250–281.

[10] I. Donald, J. Benjamin, The efficacy of surgical treatment of cancer – 20 years later, Med. Hypotheses 82 (2014) 412–420.

[11] Rajamanickam Baskar, Kuo Ann Lee, Richard Yeo, Kheng-Wei Yeoh, Cancer and radiation therapy: current advances and future directions, Int. J. Med. Sci. 9 (3) (2012) 193–199.

[12] M.J. Lind, Principles of cytotoxic chemotherapy, Medicine 36 (1) (2008) 19–23.

[13] Alan Eastman, Improving anticancer drug development begins with cell culture: misinformation perpetrated by the misuse of cytotoxicity assays, Oncotarget. 8 (5) (2017) 8854–8866.

[14] Donna S. Shewach, Robert D. Kuchta, Introduction to cancer chemotherapeutics, Chem. Rev. 109 (7) (2009) 2859–2861.

PROJECT

" Substitution Reaction "

Submitted by

Saheli Bhattacharjee

6th Semester Chemistry (Hons.)

Department Of Chemistry

Srikrishna College

Roll. 2116137 N0. 1939148

Reg No. 039028 Session : 2019-20

SRIKRISHNA COLLEGE

BAGULA

No. ..... Date .....

Department Of Chemistry

Certificate

This is to certify that Ms. Saheli Bhattacharjee, a brilliant student of Department of Chemistry, Srikrishna College, has been working under my guidance for accomplishing his Project Work (Paper: CHEM-H-T-DSE-4) for the fulfillment of B.Sc. Degree of University of Kalyani. I am forwarding his Project dissertation "Substitution Reaction" being submitted for B.Sc. (Hons.) in Chemistry degree of University of Kalyani. I strongly recommend that he has fulfilled all the requirements according to the rules of University of Kalyani regarding the work embodied in this Project.

02/07/2022

Signature

ABSTRACT

Substitution reactions are chemical reactions characterized by the replacement of a functional group in a molecule or ion by another functional group. During the substitution, the bond between the functional group (or a ligand) and the reactive centre is broken, while a new bond is formed between that centre and the new functional group (or ligand). Substitution reactions are one of the most important classes of reactions in organic chemistry. This chapter presents the mechanisms of substitution reactions and their classification according to various nomenclatures. The classification of Ingold is adopted. Symmetrical methyl transfer reactions are discussed as exemplary SN2 nucleophilic substitutions and explained using state correlation diagram proposed by Shaik and Pross. The Intersecting-State Model is employed to interpret the reactivity trends found in these reactions. Cross-reactions in methyl transfers are analysed in the perspective of Marcus cross-relation. Solvent effects are discussed in detail.

1-chlorobutane, 1-bromobutane, and 2-bromobutane. The SN2 reactions that formed precipitate that were not predict to do so we're 2-bromo-2-methylpropane and 1-chloro-2- butane.

2. Alkyl halides can react with Sn2 or Sn1 mechanisms. Sn2 requires a goodnucleophile (like I-) and a polar aprotic solvent (like acetone). Primary and Secondary halidesreact well with Sn2 but not tertiary because of steric hindrance. Sn1 requires a weakernucleophile (like EtOH) and a promoter of carbocation formation (like Ag+). Tertiary andSecondary halides react best with Sn1 but not primary halides (unless rearrangement cansimultaneously occur). Heat is good to help speed up the reaction.

REFERENCE

[1] March, J. "Advanced Organic Chemistry", 4th edition, Wiley interscience, New York, 1992.

[2] [a] Quin, L.D. "A guide to Organophosphorous Chemistry", Wiley-Interscience, New York,2000, p 2.