

From:

Arpita A. Patil
Amruta S. Bhogi
Hrishikesh R. Dixit

To:

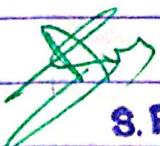
The Principal,
S.B. Arts & K.C.P Science College
Vijayapura - 586103

Sub: Regarding Seed money for project
2019-2020

Respected Sir,
we, the above mentioned students of PG-IV
Semester Physics, under the guidance of
Dr. Ginja M. Nimbale mam are performing the
project for the academic year - 2019-2020
Project title: - "Green synthesis & characterization
of silver nanoparticles from aqueous leaf
extract of - 'Duranta erecta' plant

The estimated amount for the
project is enclosed so we request you
Sir to sanction the seed money for
the project

Thankyou very much


Principal,
S. B. Arts & KCP Sc. College,
Bijapur

Date - 28-02-2020

Place - Vijayapura

Yours faithfully

(Hrishikesh Dixit)

Dixit

(28/02/2020)

(Dr. Ginja M. Nimbale)

GREEN SYNTHESIS AND CHARACTERIZATION OF SILVER NANOPARTICLES FROM AQUEOUS LEAF EXTRACT OF 'Duranta erecta' PLANT

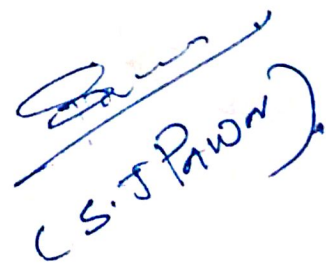
Silver Nanoparticles of size 1- 100 nm are being prepared by reducing AgNO₃ solution in the leaf extract of Duranta erecta and which have antibacterial activity against gram negative bacteria. The synthesized nanoparticles are further characterized under FESEM, FTIR, UV-Vis and XRD in the CENS laboratory Bengaluru.

Compound/characterization	Quantity	Price
1.Silver Nitrate-AR Grade	1×10gms	₹1878/-
2.Deionised water	1×5liters	₹300/-
3.Magnetic stirring bead	1	₹100/-
4.FTIR	1	₹500/-
5.UV-VIS-NIR	1	₹300/-
6.XRD	1	₹1200/-
7.FESEM- EDS	1	₹1000/-
8.EDX	1.	₹800/-
	Total:	₹6078/-



**Principal,
S. B. Arts & KCP Sc. College,
Bijapur**

Sanctioned Rs. 6078/-
on 4-3-20
R.H. Bidari
Teacher


(S. J. Pawar)

To,

02.03.2020

The Principal,
S.B.Arts and K.C.P. Science,
College, Vijayapur

From,

Dr. S.D. Lamani,
P.G. Department of Chemistry,
S.B. Arts and K.C.P. Science
College, Vijayapur

Subject: Regarding the application for the release fund for the project.

Respected sir,

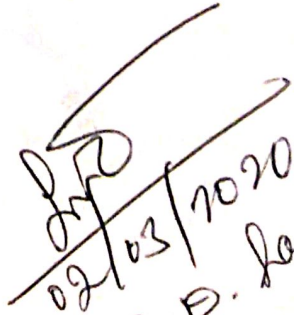
With respect to the above cited subject I the undersigned Dr. S.D.Lamani, for your kind information I am working on **Electrochemical oxidation** and **catalysed oxidation** with my six students group. I am very much eager to do the work, try to publish in national and international reputed journal, so kindly I request you to sanction Rs.10,000⁰⁰ and do the needful.

Student's name

- 1) Pooja.Sajjan
- 2) Vijayalaxmi. Meti
- 3) Akshata. Marab
- 4) Suvarna. Gidaganti
- 5) Santhosh. Yallur
- 6) Bibizahera. Bevanur

Thanking you


Principal,
S. B. Arts & KCP Sc. College,
Bijapur


02/03/2020
Dr. S. D. Lamani

Summary of project work

Title of the Project: Catalysed oxidation and reduction of Biologically Important compounds and determination of Thermodynamic Parameter.

Kinetic studies are receiving much importance in the recent years since they provide us the most powerful method of investigating the detailed reaction mechanisms. It is one of the most intriguing and challenging areas of chemistry, which deals with the mechanisms of reactions. To many chemists the real heart of chemistry is the study of mechanisms. Thus, chemical kinetics can be defined as that branch of chemistry concerned with the study and prediction of time dependent systems. To understand the mechanism of any reaction we must know a reaction as a function of time, the exact positions of all the atoms as the reactants are converted into product molecules. Virtually all information regarding reaction mechanism comes by inference of indirect evidence. Hence, it is the important job of chemists to device the proper experiments to generate most conclusive evidence.

The kinetic data will be the source of a great deal of detailed insight into the mechanism of a reaction. Although, other types of experimental evidences are also sought for purpose of formulating a reaction mechanism, the study of reaction kinetics generally forms the backbone of a thorough mechanistic investigation. Finally, as an area of pure science in itself, the study of rates and mechanism is one of rich varieties, concerned with the chemistry of every element and full of experimental challenges.

The award of Nobel prize for the year 1992 to Prof. R. A. Marcus on the "Electron Transfer Reactions" and 1999 Nobel prize to Prof. Ahmed Zewail for discovery of "Femtochemistry" and 2001 Nobel prize to Profs. William Knowles, K. Barry Sharpless and Royji Noyori for their work on "Chirally Catalysed Hydrogenation Reactions" and 2005 Nobel

Prize to Profs. Robert Grubbs, Richard Schrock, and Yves Chauvin on their research achievements on "Metathesis Catalyst Technology" emphasize the importance of field of reaction kinetics. Electron transfer reactions play a significant role in physical, chemical and biological processes. Because of the ubiquity of electron transfer processes, the study of electron transfer reactions, perhaps more so than that of any other area of chemistry is characterized by a strong interplay of theory and experiment¹. Nonetheless the importance of electron transfer in transition metal redox chemistry has been recognised² and more recently it has become increasingly obvious that many reactions in organic chemistry once thought to be concerted in nature also occur via sequential one electron steps³.

The work of Henry Taube⁴ in redox systems unequivocally demonstrated the transport of electron from reductant to oxidant. This discovery certainly added many important features in the syntheses of coordination complexes and organometallics. It is such a subject, which has manifestations in almost all walks of life. As a result, oxidation-reduction reaction needs at least two reactants, one capable of gaining electrons (oxidant) and the other capable of losing electrons (reductant), i.e., a reducing agent (reductant) by losing electrons, gets oxidised and an oxidising agent (oxidant), by gaining the electrons, gets reduced.

The reaction thus consists of transfer of electrons from a reducing agent to an oxidising agent, so that there cannot be an oxidation without concomitant, reduction. Such cases where oxidation and reduction are involved are commonly termed as redox reactions; and such a redox system involves a redox potential. It follows automatically, that any oxidation-reduction reaction must involve two redox couples that differ in their affinity for electrons. This affinity of atoms for electrons is conferred to them by their particular atomic structure and it is expressed in terms of reduction potential or redox potential. Reduction potential of a redox couple is its tendency to

get reduced from one oxidation state to another oxidation state. Redox reactions are also defined as involving changes in oxidation states or oxidation numbers. In a redox reaction, the oxidation number of the oxidant decreases and that of the reductant increases. The transfer of electrons is a book keeping device for effecting the changes in oxidation states and for balancing the equations.

Particularly in aqueous solutions, it is usually possible to imagine atom or group transfer, rather than electron transfer, as occurring in a redox reaction. For example, iron(II) ion may act as a reducing agent by transferring a hydrogen atom from its hydration shell to a substrate⁵. Iron(III) ion may act as an oxidising agent by transferring hydroxyl radical to a substrate⁵:



In general, transfer of a positive group or atom is equivalent to the transfer of electrons and transfer of a negative group or atoms is equivalent to the taking up of electrons. The problem, then, in studying the mechanism of an oxidation–reduction reaction, is to find out whether atom transfer or electron transfer occurs, which atoms are transferred, and what intermediates, stable or unstable species are formed. A complete study would include a detailed picture of the transition state for all steps involved. Not only the composition but also the geometry of the transition state is desired.

Oxidation–reduction in inorganic reactions

Two general classes of transition states emerge for redox reactions involving metal complexes, the so called “*outer-sphere and inner-sphere types*”⁶. In the first of these, the

inner co-ordination shells of both the metal ions are intact in the transition state. In the second case, the two metal ions are connected through a bridging ligand common to both the co-ordination shells. From *Franck-Condon principle*, it follows that before electron transfer between two ions is possible, the energy of the electron must be the same in the two sites. There must also be sufficient orbital overlap between the two sites to provide for a reasonable probability of a transfer.

Oxidation-reduction in organic reactions

The oxidation-reduction concepts, however, are not so clearly applicable in organic chemistry, when carbon compounds are oxidised their component atoms are very seldom deprived of their surrounding complete electron shells. Covalent bond fission is an essential feature of organic reactions and it can be affected by two different pathways⁷, viz., "*Homolytic reactions*" in which electron pairs are symmetrically disrupted and "*Heterolytic reactions*" in which electron pairs are transferred from one molecule to another as an undivided entity. Electron removal by these two pathways has clearly distinguishable characteristics.

Probable ways of electron transfer reactions

Oxidation-reduction reaction may involve one or more electron transfer. Depending upon the number of electrons transferred between oxidant and reductant, the reaction may proceed in one or more steps. Transition metals such as iron and cobalt and several others usually exhibit stable oxidation states differing by one electron and react with each other through one equivalent steps. However, the stable oxidation states in post transition elements such as arsenic, antimony etc., differ by two electrons. Thus, on the basis of their pattern of reactivity, the reactions of these elements are classified into two main categories,^{4,5,8} **Complementary and Non-complementary reactions.**

Complementary reactions

The oxidant and reductant change their oxidation state by an equal number of units. These are termed as complementary electron transfer reactions⁶.

e.g. (i) One equivalent – One equivalent reaction

These are the electron reactions in which there occurs the transfer of one electron from one species to the other. These simple reactions serve as models for more complicated systems and their study has proved invaluable in developing and understanding of the electron transfer in solution⁹. e.g.



(ii) Two-equivalent – Two-equivalent reactions^{9,10}



A large number of complementary reactions have been explained by assuming the formation of bridged activated complexes between the oxidant and the reductant for the facile transfer of electron through the bridging ligand.

Non-complementary reactions

Non-complementary reactions are those in which oxidant and reductant undergo unequal equivalent changes such as one - equivalent oxidant interacts with two-equivalent reductant and two-equivalent oxidant interacts with one - equivalent reductant. There are a number of possibilities of electron transfer in non-complementary reactions and these are related to the nature of both oxidant and reductant.

Multi equivalent reactions

Oxidising agents such as chromium(VI) and manganese(VII) undergo net changes of 3 and 5 units in oxidation number respectively during their reactions in acidic solution¹¹. For the

most part, these reactions occur by one or two electron steps, with the necessary intervention of unstable intermediate oxidation states of chromium or manganese. The reactions of chromium(VI) with transition metal complexes generally proceed by sequential one-electron step, but with post transition metal ions and with non-metallic compounds, two electron steps appear to be preferred.

Project Plan:

Chemical Kinetics and Electrochemistry studies are widely used in organic, Inorganic and physical chemistry with modern technique, we have plan on oxidation and reduction processes with biologically active fluids and oxidants. In this work we have to investigate stoichiometry, proposed reaction mechanisms and have derive the rate law. After deriving the rate law, authors are calculate to thermodynamic parameters in different temperature. Completion of this work immediately we have to publish this work in reputed national and international journals.

REFERENCES

1. **J. J. Zuckerman**, "*Inorganic Reactions and Methods*", Vol. 15, VCH Publishers, Florida, (1986)
2. **Sir. G. Wilkinson**, "*Comprehensive Coordination Chemistry*", Vol. 1, Pergamon Press, (1987), p. 332
3. **R. A. Sheldon and J. K. Kochi**, "*Metal Catalysed Oxidation of Organic Compounds*", Academic Press, New York, (1981)
4. **H. Taube**, "*Electron Transfer Reactions of Metal Complexes in Solution*", Academic Press, New York, (1967)
5. **F. Basolo and R. G. Pearson**, "*Mechanisms of Inorganic Reactions*", John Wiley and Sons, Inc., New York, 2nd Ed., (1967), p. 454, p.474, p. 490.

Catalysed oxidation and reduction of biologically important compounds and determination of thermodynamic parameter

The chemical kinetics and thermodynamic parameter have been determined by using double beam spectrophotometer, in acidic media or aqueous alkaline media, maintaining ionic strength and di-butyl alcohol proposing reaction mechanism, and rate law, isolating reaction product with suitable solvent and characterized by using IR, NMR, LCMS, UV Visible spectral studies.

Expenditure:

Compound	Quantity	Price
Carbamezepine	1X100	4500=00
Cimetidine	1X100	3908=00
DPA (III)	1X50	2050=00
DPC(III)	1X50	1728=00
	Total:	12186=00

Less

$\frac{2186=4}{10,000/-}$

Sanjay Rs. 10,000/-
on 4-3-20

~~_____~~
(R.H. Bidaar)
~~_____~~

~~_____~~
(S.S. Pawar)

To,

04.03.2020

The Principal,
S.B. Arts and K.C.P Science College,
Vijayapur-586103,

From,

Dr. Manjunath Hariharamath,
Assistant Professor,

Subject: Regarding Application for the release of fund for project.

Respected Sir

With respect to the above cited subject I the undersigned, Dr. Manjunath Hariharamath for your kind information I m working on synthesis and characterization of benzofuran and its derivatives I am very much eager to do the work and try to publish in national and international reputed journals so kindly I Request you to sanction the amount ~~10000~~00 Rs and do the needful.

8000/-

List of students

1. Leela Harijan
2. Amruta Kashetti
3. Deepa Kamble
4. Sachin Umarani
5. Veeresh kambi

Thanking You

Manjunath H. M.
04/03/2020.


Principal,
S. B. Arts & KCP Sc. College,
Bijapur

Research Project Proposal

Title of the project: Synthesis and Characterization of Benzofuran its derivatives.


SI No	Chemicals	Quantity	Rate
1.	O-Vanilline	100gm	2200=00
2.	Salicyaldehyde	100gm	1600=00
3.	Chloroacetone	100ml	600=00
4.	Sodium ethoxide	100gm	500=00
5.	Connector Bending	1	250=00
6.	Chloroethyl acetate	100ml	600=00
7.	P-nitrobenzaldehyde	500ml	1250=00
8.	O-chlorobenzaldehyde	500ml	1250=00
		TOTAL	8000=00



Principal,
B. Arts & KCP Sc. College,
Bijapur

Sanctioned Rs. 8000/-
on 4-3-20

(RHBidasi)


(S. J. Pawar)

Project guide

Dr. Manjunath Hariharmath

Heeralun H. m
09/03/2020