



# ANWARUL ULOOM COLLEGE (AUTONOMOUS)

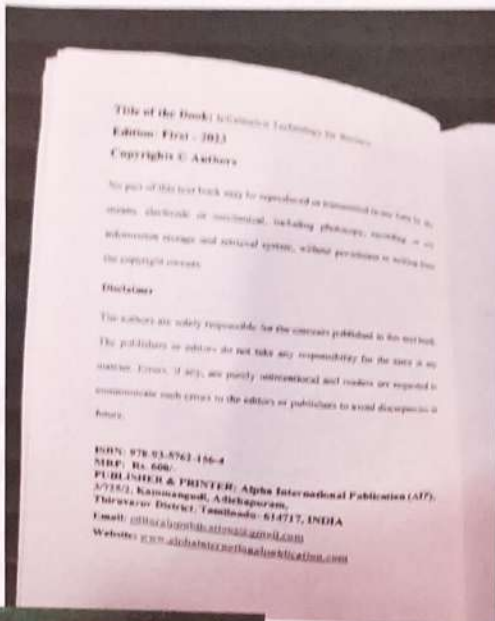
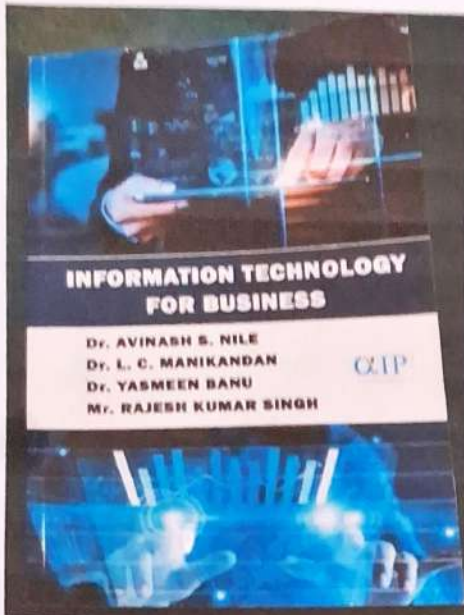
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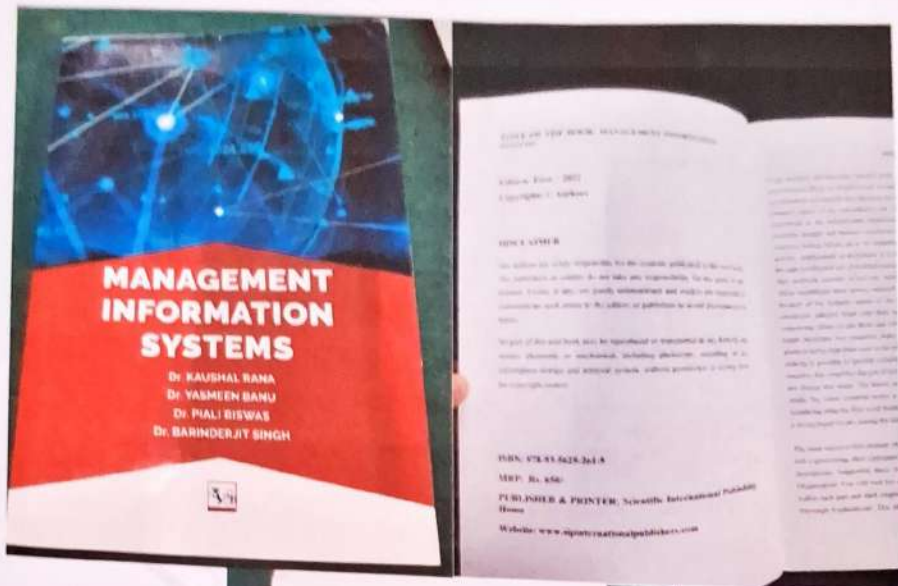
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## MANAGEMENT INFORMATION SYSTEMS

Dr. KAUSHAL BANA  
Dr. YASMEEN BANU  
Dr. HALI BISWAS  
Dr. BARINDERJIT SINGH



COVER AND OPEN BOOK, MANAGEMENT INFORMATION SYSTEMS

ISBN: 978-93-5625-261-5

ISBN: 978-93-5625-261-5

ISBN: 978-93-5625-261-5

MRP: Rs. 450/-

PUBLISHER & PRINTER: Scientific International Publishing House

Website: [www.scientificinternationalpublishers.com](http://www.scientificinternationalpublishers.com)

### AUTHORS PROFILE



Dr. Kaushal Bana is a young professional with a B.Tech. degree from Osmania University, Hyderabad. He has worked in various capacities in the IT industry for over 10 years. He is currently working as a Senior Software Engineer at a leading IT company in Hyderabad. He has a strong passion for learning and is always up-to-date with the latest trends in the IT industry.



Dr. Yasmeen Banu is an Assistant Professor in the Department of Business Administration at Anwarul Uloom College, New Malleshpally, Hyderabad. She has a Ph.D. in Business Administration from Osmania University, Hyderabad. She has worked in various capacities in the IT industry for over 10 years. She has a strong passion for learning and is always up-to-date with the latest trends in the IT industry.



Dr. Hali Biswas is an Assistant Professor in the Department of Business Administration at Anwarul Uloom College, New Malleshpally, Hyderabad. She has a Ph.D. in Business Administration from Osmania University, Hyderabad. She has worked in various capacities in the IT industry for over 10 years. She has a strong passion for learning and is always up-to-date with the latest trends in the IT industry.



Dr. Barinderjit Singh earned a B.Tech. (Food Technology), M.Tech. (Food Engineering and Technology), Ph.D. (Food Technology) and MBA (Operation Management). Apart from this, he also holds a PG Diploma in Dairy Technology. He has worked in various capacities in the IT industry for over 10 years. He has a strong passion for learning and is always up-to-date with the latest trends in the IT industry.

Scientific International Publishing House

ISBN: 978-93-5625-261-5  
[www.scientificinternationalpublishers.com](http://www.scientificinternationalpublishers.com)

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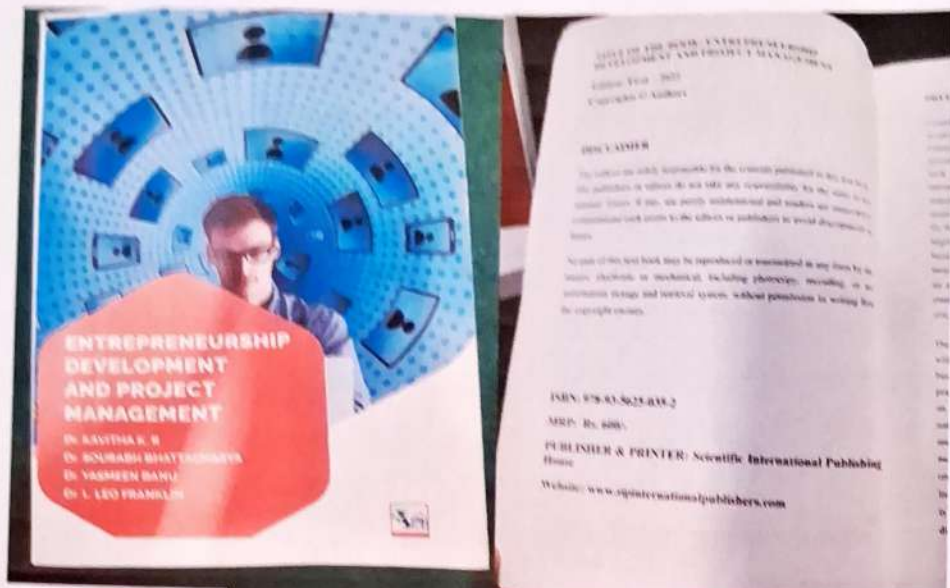
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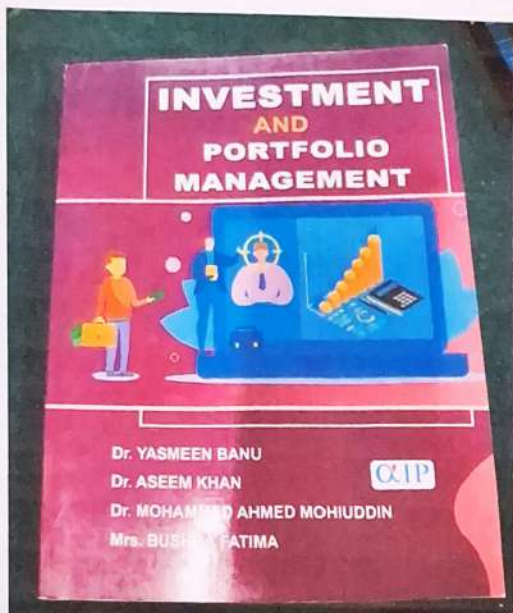
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Title of the Book: Investment and Portfolio Management  
 Edition: First - 2022  
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ISBN: 978-93-95405-16-4  
 MRP: Rs. 600/-  
 PUBLISHER & PRINTER: Alpha International Publication (AIP),  
 3/252, Kammangudi, Adichapuram,  
 Thiruvaur District, Tamilnadu- 614717, INDIA  
 Email: [alphaipublications@gmail.com](mailto:alphaipublications@gmail.com)  
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**Author's Profile**

**Dr. Yasmeen Banu** working as an Associate Professor & Head Department of Business Administration at Anwarul Uloom College, New Malleshpally, Hyderabad. She had done UG & PG from Osmania University Hyderabad, Hyderabad, India. She had done Ph.D. in the field of Commerce from Osmania University for Studies, Anantapur, Pradesh. She has teaching papers in National and International Journals, Conferences and Symposiums. Her main area of interest includes Financial Accounting, Business Statistics, Quantitative Techniques for Business Decision, Income Tax Marketing, C++, Java, Oracle Web Technologies, Accounting Systems etc.

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**Dr. Mohammed Ahmed Mohiuddin** working as an Associate Professor & Head of Department of Commerce (General) at Anwarul Uloom College, New Malleshpally, Hyderabad. He had done his Master of Commerce from Osmania University, Hyderabad, Telangana, India. He has completed his Ph.D. in the commerce from Rayalaseema University, Kurnool, Andhra Pradesh, India. He has teaching experience of more than 28 years for both UG & PG. He has presented number of papers in National Journals, Conferences and Seminars. His main area of interest includes Financial Accounting, Advanced Accounting, Corporate Accounting, Direct Taxes, Indirect Taxes, Investment Management etc.

**Mrs. Bushra Fatima** working as an Assistant Professor in Commerce at Anwarul Uloom College, New Malleshpally, Hyderabad, Telangana, India. She has done her M.Com from Sarojini Naidu Vaidya Maha Vidyalaya and B.Ed from Ghulam Ahmad College of Education. She has qualified APSET in Commerce. She has around 18 years of teaching experience in her both UG and PG and has written articles in National Journal, her main area of interest includes Financial Accounting, Business Economics, Information Technology, Business Statistics, Financial Services, Advanced Corporate Accounting etc.

**Alpha International Publication (AIP)** ISBN 978-93-95405-16-4

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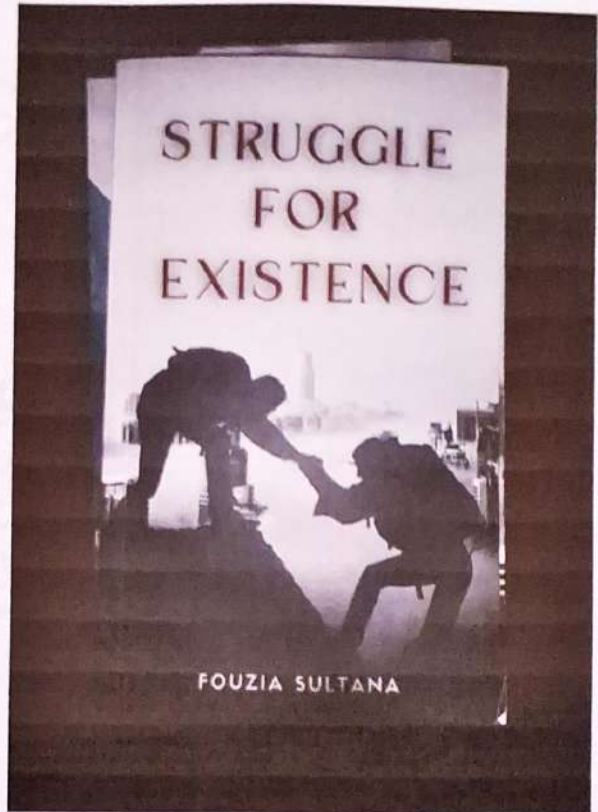
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Mrs Fouzia Sultana was born on 4th June 1979 in Hyderabad, Telangana, India started her career as a High School Teacher and serve the community with her best teaching skills. She considers her faith and family the most important.

In all her free time she is with books, According to her Education is the only tool through which all the problems of the society can be solved. She has completed MA English literature in the year 2015 from Osmania University. She also won the best teacher award from COMI in the year 2018. She attended the workshops, seminars, FDP. Currently she is working as an Assistant Professor in Anwarul Uloom college mallepally Hyderabad TS.

This book struggle for existence depicts the struggle of an individual in his life.

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**Rafath Jahan** was born on 15 April 1991 in Hyderabad, Telangana, India; she completed her education at Anwar-uloom Degree College (Autonomous), affiliated to Osmania University in Hyderabad. She is an Indian writer.

Received her Bachelors of Arts (BA) in 2011, Bachelors of Education (B.Ed) in 2014, and Master of Arts in 2020. She was determined to be an educationist & serve the society & nation at large. Literature played a vital role in her life, and she sees and deals with things in the light of literature.

She has attended various seminars, webinars, workshops, orientations, programs, faculty development programs at a national level.

She is an experienced teacher, a skill course trainer, & she is a member of Global Progress Society, The Association for English Studies, India (Ln 860/2021).

She is currently an Assistant Professor at Anwarul Uloom College (Autonomous), New Mallopalay, Hyderabad.

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# Literature

## The moving Spirit

**RAFATH JAHAN**

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Waseem Khan was born on 18 July 1992 in Hyderabad Telangana India. He completed his Education at Anwarul Uloom Degree College (Autonomous) in Hyderabad, and He lives in Hyderabad. He is an Indian Author.

He earned his Bachelor's of Commerce in 2015, Bachelor's of Education in 2018 and Master's of Arts in 2020. He has a Diploma in English Language and Literature, Diploma in Communicative English and Soft Skills.

Nonetheless, he choose to be ambitious and pursued his father's dream of being an educationist. His first 15 years were crucial to his development as a educationist

He has attended various seminars, conference's, symposia workshops, refresher courses, orientation programs and faculty development programs at national and international levels.

He is an experienced English language teacher, communication skills trainer and He is the managing editor of Professor Society, The Association for English Language in India - LM 860/2021

He works as an editor and English Language Journal Writer, Notably of course books and Vocabulary books. He is currently an Assistant Professor at Anwarul Uloom College (Autonomous) of Hyderabad Telangana.

His articles in The role of language in (literature), social, emotional and intellectual development; Importance of education cradle to grave; Importance of LSRW-skills of students; The Importance of English communication skills and A global view towards understanding of standard and non standard varieties of english.

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## LANGUAGE & VOCABULARY ACQUISITION



WASEEM KHAN

(M.A. B.Ed)

*Mc*

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He earned his Bachelor's of Commerce in 2015, Bachelor's of Education in 2018 and Masters of Arts in 2020. He has a Diploma in English Language and Literature, Diploma in Communicative English and Soft Skills.

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His articles in The role of language in life: cultural, social, emotional and intellectual development, Importance of education cradle to grave, Importance of LSRW skills of students, The Importance of English communication skills and A global view towards understanding of standard and non standard varieties of English.

## ENGLISH LANGUAGE AND LITERATURE



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Sariya Armana was born on 31 January 1997 in Hyderabad Telangana India. She has completed her education in Hyderabad and she lives in Hyderabad. She earned her Bachelor's degree in 2016 and Master's (English Literature) in 2018.

Nonetheless, she chose to be ambitious and pursued his grandfather's dream of being an educationist.

She has attended various seminars, conferences, symposia, workshops, refresher courses, orientation programs and faculty development programs at national and international levels.

She is an experienced English language teacher, communication skills trainer, and she is a member of Global Professor Society, The Association for English Studies of India, IIM, etc.

Currently, she is working as an assistant professor in English at Anwarul Uloom College, Hyderabad.

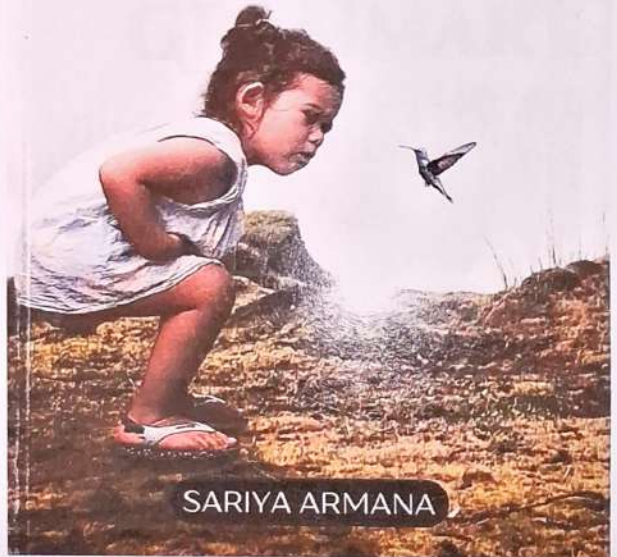


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# THE ART of LIVING



SARIYA ARMANA

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Dr Asiya Hussaini Shaikh was born in Hyderabad, brought up in Mumbai where she completed her Secondary Education. She moved to Hyderabad and completed her Graduation from Anwar -UL-Uloom College. She was a cadet of NCC Air Wing Section from the Same College.

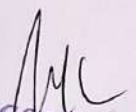
At Present She is an Associate Professor at Anwar-UI-Uloom College in the Department of English. Her versatile personality and potential skills gave her way from being a Nurse to teaching in USA Atlanta Public School for 10 years. She feels blessed to have a very Supportive husband Mr. Ali Arif Hussaini who recognised the Potential in her, which she feels led to her success as a Facilitator in her Present Endeavours.

## SIMPLIFIED GRAMMAR

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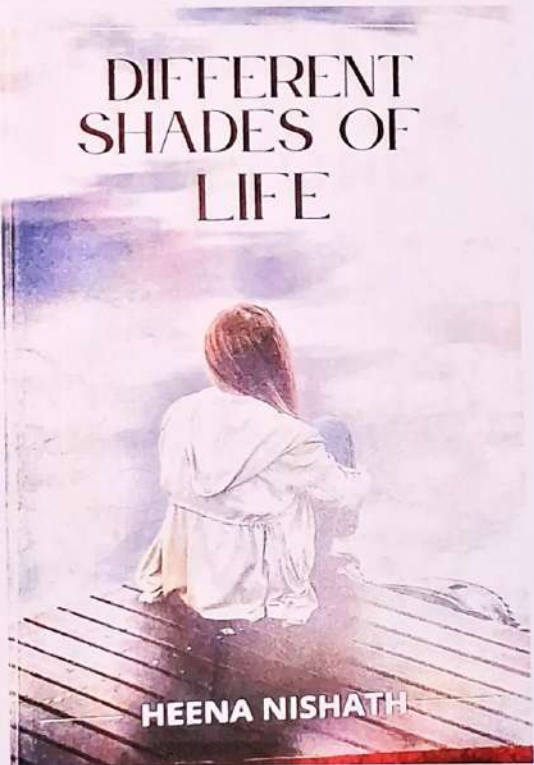


Heena Nishath was born on 18th August 1984 in Hyderabad Telangana India she completed Her education from Maulana Azad National Urdu University. she lives in Hyderabad she is an Indian author she earned her Bachelors of Arts from Princess


shahkar college Bachelor of education from M A K Azad College Ibrahimpatnam and master of Arts from Maulana Azad Maulana Azad National Urdu University.

she has earned special executive training with lessons on personality development public speaking American as well as British accents nevertheless she chose to be ambitious and pursued his parental dream of being an educationist she has attended various seminars conferences symposia workshops refresher courses orientation programs and Faculty Development programs at National and international level. She is an experienced English language teacher committed in this profession. He is a member of global professional association for English studies of India and She is currently working as assistant professor at Anwarul Uloom College (Autonomous) of Hyderabad, Telangana.

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Capt. Dr. Kausar Begum Khan was born on 03 December 1969 in Hyderabad, Telangana India. She completed her education at "University of Pune" which is now known as "Savitribai Phule Pune University" in Pune. She lives in Hyderabad. She is an Indian Author.

Nonetheless, she choose to be ambitious and pursued her father's dream of being an educationist.

She has attended various seminars, conference's, symposia workshops, refresher courses, orientation programs and faculty development programs at national and international levels.

She is working since 20 years, A social activist and concerned citizen, Associated with various Social Service Associations, Champion for the cause of Emancipation of Women. She is the member of Global Professor Society, The Association of English Studies of India - LM 860/2021. She is currently an Associate Professor at Anwarul Uloom College (Autonomous) of Hyderabad Telangana.

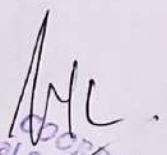
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**A.S. Sumaiya Siddiqua**  
(M.A B. Ed ,B.A )Born on 8th August, in Bangalore, Karnataka India

Since 20 years Inhabited in Hyderabad and She has completed her M.A in English Literature from Anwar Uloom PG College Hyderabad, Telangana, India.

She has more than 17 years of experience in her Employment Chronology as an Educationist and Entrepreneur. She incorporates in Humanity services and Women Empowerment, Anticipating being a Life coach.

She has Participated and Coordinated various Seminar, Webinar and Workshops, FDP, Orientation program at National and International level. Working as Assistant professor in Anwar uloom group of Institution, and member of Global Professor Society and The Association for English Standard of India.

- She has collection of poetry, articles and blogs (Blueprints of life) on where are we heading?  
Parts of life; value Education, Innovative Education.



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## English Language

*A Way of Communication*



**A.S SUMAIYA SIDDIQUA**

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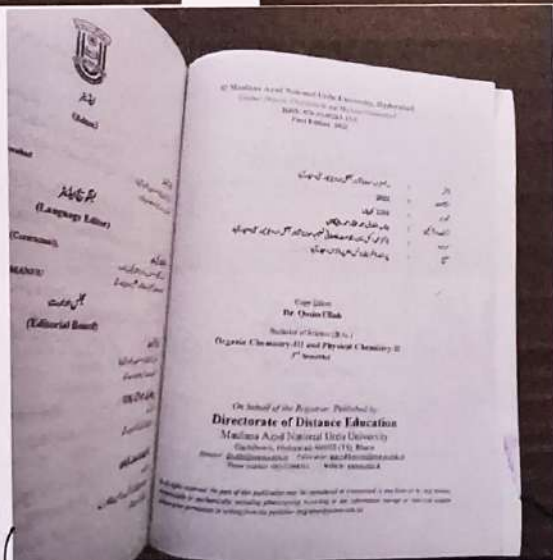
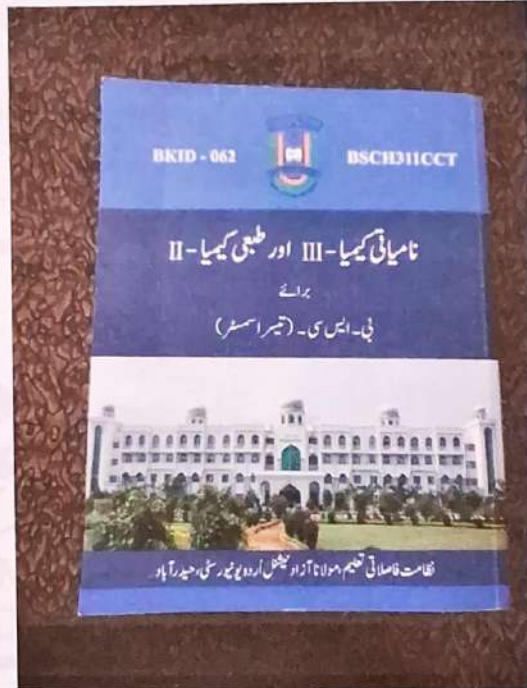
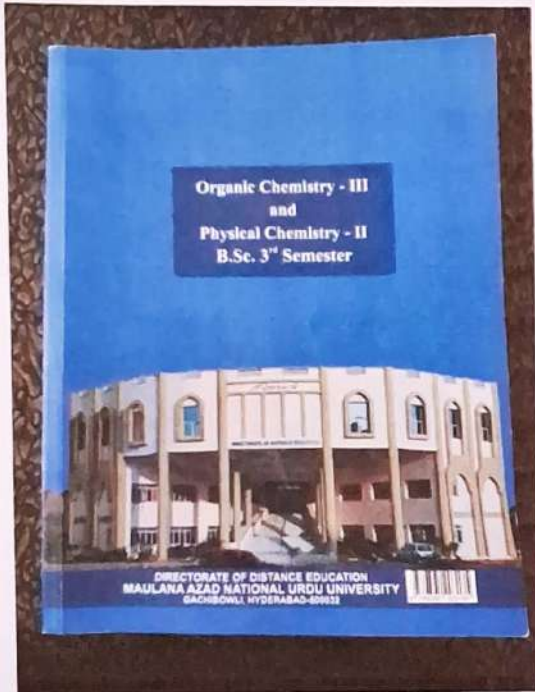
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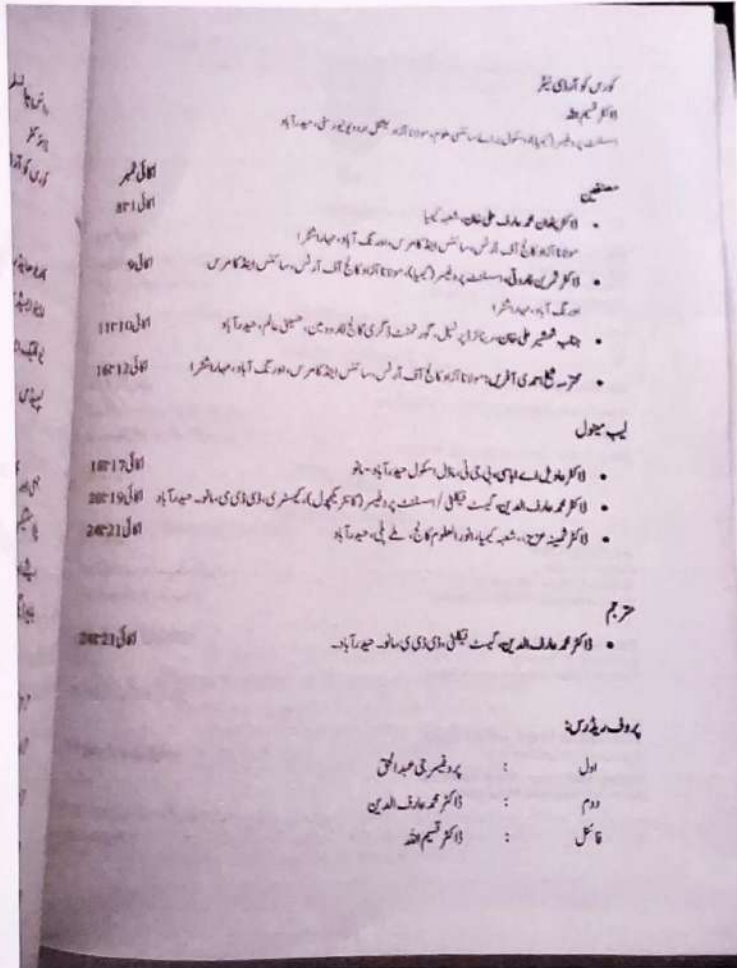
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*M. Khafar*  
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اکائی 21 - کیلوری میٹرکی حرارت کی گنجائش کی تعیین  
(Determination of Heat Capacity of a Calorimeter)

- اہل کے لئے  
(Aim) مقصد  
(Apparatus) آلات  
(Principle) اصول  
(Procedure) طریقہ کار  
(Graph) گراف  
(Calculations) حسابات  
(Observation Table) مشاہداتی جدول

(Aim) مقصد

کیلوری میٹرکی حرارت کی گنجائش کی تعیین کرنا۔

(Apparatus) آلات

- |                      |                            |
|----------------------|----------------------------|
| (Calorimeter)        | 1. حراری بیجا              |
| (Glass Stirrer)      | 2. گلاس کی بلانے والی سلاخ |
| (Stop Watch)         | 3. اسٹاپ واچ               |
| (Beaker)             | 4. منتقارہ یا بیکر         |
| (Measuring Cylinder) | 5. پیمائش استوانہ          |
| (Distilled Water)    | 6. کشیدہ پانی              |

(Principle) اصول

کیلوری میٹرکی حرارت کی گنجائش (Heat Capacity) سے مراد حرارت کی وہ مقدار ہے جو کہ  $1^{\circ}\text{C}$  میں کے اضافہ پر کیلوری

کامیابی جذب (Absorbed) ہوتی ہے۔

$$Q = ms \Delta t$$

(16)

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اکائی 22۔ سوڈیم ہائیڈروآکسائیڈ کے ساتھ ہائیڈروکلورک ایسڈ کی  
حرارت تعدیلی کی تعیین

(Determination of Heat of Neutralization of Hydrochloric Acid with Sodium Hydroxide)

اکائی کے لئے

(Aim) مقصد

(Apparatus) آلات

(Principle) اصول

(Procedure) طریقہ کار

(Graph) گراف

(Result) نتیجہ

---

(Aim) مقصد

اس تجربے سے سوڈیم ہائیڈروآکسائیڈ کی ہائیڈروکلورک ترقی کے ساتھ تعدیلی کے عمل کی حرارت (Heat) کی تعیین کرنا۔

---

(Apparatus) آلات

1.	کیلوری میٹر	(Calorimeter)
2.	گلاس کی ہائے والی سٹیرر	(Glass Stirrer)
3.	اسٹاپ واچ	(Stop Watch)
4.	مختارہ پائیکر	(Beaker)
5.	0.5 N سوڈیم ہائیڈروآکسائیڈ کا محلول	
6.	0.5 N ہائیڈروکلورک ایسڈ کا محلول	

---

(Principle) اصول

حرارت تعدیلی (Heat of Neutralization) کی دو حصوں میں تقسیم کرنا: گرم معادل (Gram Equivalent) اور سرد معادل (Gram Equivalent) کے ساتھ تعدیلی (Neutralization) کرنے کے ساتھ حرارت

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اکائی 23 - pH مپا کے استعمال کے ذریعے مختلف محلولوں جیسے کہ Aerated  
Shampoos · Fruit Juices · Drinks اور صابن وغیرہ کے pH کی پیمائش  
(Measurement of pH of Different Solutions Like Aerated Drinks, Fruit Juices, Shampoos  
and Soaps using pH-meter)

اکائی کے تحت  
(Aim) مقصد  
(Apparatus) آلات  
میں ترمیم  
(Chemical Substances) کیمیائی اشیاء  
(Principle) اصول  
(Procedure) طریقہ کار  
(Result) نتیجہ

---

(Aim) مقصد

pH مپا کے ذریعے دیے گئے محلولوں جیسے Aerated Drinks · Fruit Juices · Shampoos اور صابن کی pH کی  
پیمائش کرنے۔

---

(Apparatus) آلات

(pH Meter)	pH مپا	1
(Combined Glass Electrodes)	مشترکہ گلاس الیکٹروڈ	2
(100 ml Beaker)	100 ml کا مپتارہ	3
(Measuring Cylinder)	پیمائشی استوانہ	4

---

(Chemical Substances) کیمیائی اشیاء

pH 4 اور pH 9 کے معیاری بفر محلول (Standard Buffer Solutions)

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اکائی 24 - pH پیال معاصرہ (pH Metric Titration) کے ذریعے  
 Strong Base (NaOH) Strong Acid (HCl) کے ساتھ  
 Titration کے ذریعے ان کی طاقت (Strength) کی تعیین  
 [Determination of Strength of Strong Acid (HCl) by pH Metric Titration with  
 Strong Base (NaOH)]

(اکائی کے تحت)

(Aim) مقصد

(Apparatus) آلات

(Chemical Substances) کیمیائی اشیا

(Principle) اصول

(Procedure) طریقہ کار

(Graph) گراف

(Result) نتیجہ

---

(Aim) مقصد

pH میٹر کے ذریعے HCl کے معلوم نکلوان کی Strength NaOH کے معلوم نکلوان کے ساتھ Titration کے ذریعے معلوم کرنا

(Apparatus) آلات

pH Meter	pH میٹر	1.
Combined Glass Electrode	مشترک کرکٹس الیکٹروڈ	2.
(100 ml Beaker)	100 ml کا دستارہ یا بیکر	3.
(Burette (50 ml))	عمرکب (50 ml)	4.
(Pipette)	پایپٹ	5.
(Balance)	اسٹری (ملائی)	6.

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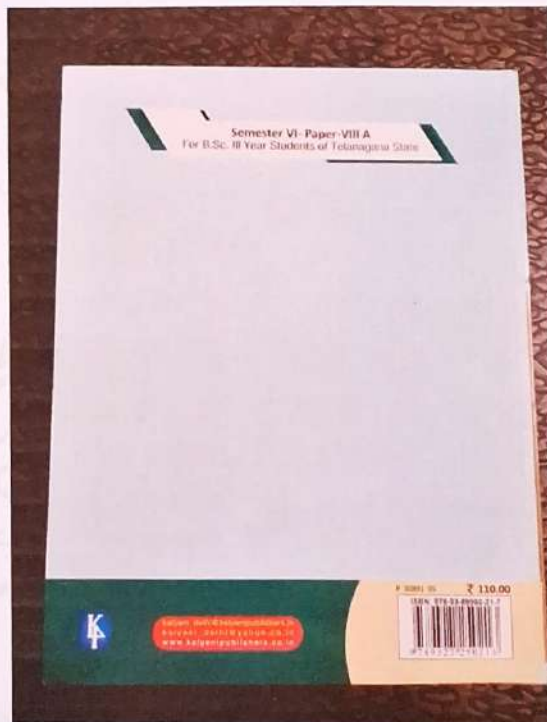
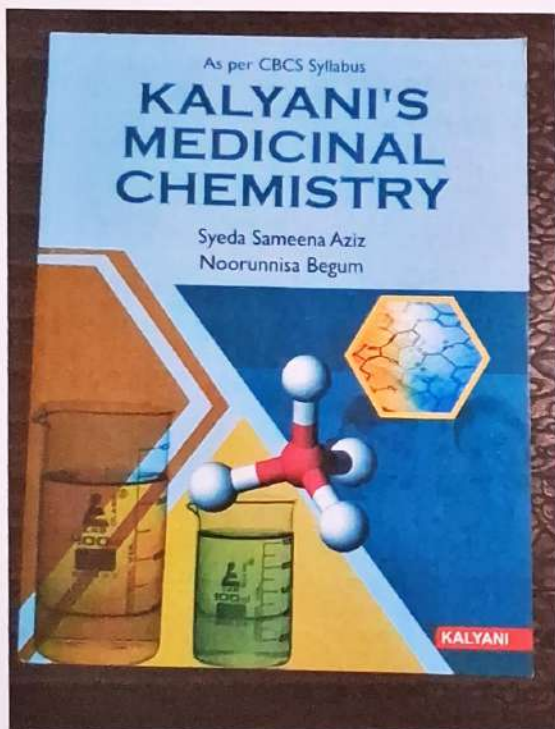
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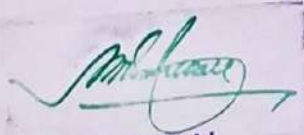
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Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January 2023)

## An Efficient Greener Acylation of Few Substituted Aromatic Anilines Using Dragon Fruit Extract as a Catalyst

Noorunnisa Begum<sup>1</sup>, Syed Maher Shareef<sup>1</sup>, Syeda Sameera Aziz<sup>2</sup>

<sup>1</sup>Department of Chemistry, Anwarul Uloom College, Malleshpally, Hyderabad-15, India  
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### Abstract

For the last few years, natural fruit extracts are increasingly being used in organic synthesis for their sustainable & safety aspects towards the environment. Keeping the importance of greener approach in chemistry we selected the dragon fruit extract as an efficient greener catalyst for the acylation of few substituted aromatic anilines such as 2-nitro aniline, 4-nitro aniline, *O*-toluidine, *P*-toluidine and *P*-anisidine using (acetyl chloride) as a green solvent and acetyl chloride as an acylating agent. The acylated compounds using dragon fruit extract as catalyst are obtained in high yields. The acylated compounds are characterized by their melting points, IR, <sup>1</sup>H & <sup>13</sup>C-NMR values. Mild conditions, simplicity and easier workup are the main protocols of our acylation reaction using green catalyst.

**Keywords:** Substituted aromatic anilines, green solvent, sustainable acylation, green chemistry and Dragon fruit extract (DFF).

### Introduction

Making chemistry safer for its practitioners has been of major importance in relatively recent times. Natural substances are increasingly being used as a catalyst in the synthesis of organic compounds for their safety aspects towards the environment. Application of eco-friendly processes has created a new path towards green chemistry by using the natural resources<sup>1,2,3</sup>. Keeping this in view we used Dragon fruit pulp's extract as a catalyst in the acylation of a few selected substituted aromatic anilines. We chose anilines because of their simple structure and versatile nature to be used as starting material for finer chemical synthesis. N-acylation of animes also provides an efficient and low cost means to protect their amine groups in a multi acetyl organic process<sup>4,5</sup>. This process is carried out by reacting amines with reagents containing acyl group (acetyl chloride and acetic anhydride) in the presence of acid and basic catalysts. The use of catalysts such as K<sub>2</sub>CO<sub>3</sub>, ZnCl<sub>2</sub>, Sodium formate<sup>6</sup>, Amberlite IR, OP<sup>7</sup>, FeCl<sub>3</sub><sup>8</sup>, Al(OH)<sub>3</sub><sup>9</sup>, TiCl<sub>4</sub>/OTf<sup>10</sup>, BOCH<sub>3</sub>Cl<sup>11</sup>, anhydrous NiCl<sub>2</sub><sup>12</sup> and iodine<sup>13</sup> have been reported for the N-acylation under various conditions. However, many of these methods suffered from various draw backs such as long reaction time, tedious process and high cost. Keeping this in view the present method was adopted for minimizing the above said negative impacts wherein

202 ISBN: 978-93-95544-30-2

Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January 2023)

we have developed eco-friendly N-acylation reaction which is an environmentally benign approach towards the synthesis of chemo selective and N-acylated compounds using natural product- Pure extract of dragon fruit (PEDF) as an acid catalyst whose pH is reported as 4.8. The N-acylation of animes is carried out with acylating agents such as acetyl chloride and acetic anhydride.

### Experimental Method

#### Preparation of Catalyst

A ripened Dragon fruit (*Seleniceneausulatus*) was obtained from a supermarket. The fruit was peeled and its pulp was chopped into small pieces and washed. With the help of a strainer out of the juice was extracted from the pulp. Process yielded 30 ml of pure extract. The extract was stored in a refrigerator to maintain its freshness and for further use.

#### Procedure for Acylation

To a mixture of substrate (1 mmole) acylating agent, acetic anhydride/acetyl Chloride (1.2 mmole), 2 ml of PEDF (Pure extract of dragon fruit) is added and stirred at room temperature for 2 minutes (Scheme 1 and 2 respectively).

#### Scheme 1



#### Scheme 2



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Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences", 20<sup>th</sup> & 21<sup>st</sup> January, 2023

## Amla Fruit Extract Catalysed Green and Sustainable Acylation of Some Selected Substituted Aromatic Anilines

Narasimhan Durgam\*, Madhu Adil Ali<sup>1</sup>, Sreeraj Sumanthra Akil<sup>2</sup>  
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### Abstract

Green chemistry has recently emerged as a significant and sustainable technology in organic chemistry to create safe pathways for synthesizing physiologically active organic molecules. As the first factors are easily available, cheap, and can be easily extracted, the natural Amla fruit extract is an efficient green catalyst for acylation of some substituted aromatic anilines (e.g. 2-amino aniline, 4-amino aniline, 4-methoxy aniline, and p-toluidine). This work provides the acylated products of the above-mentioned compounds in good yield. The acylated compounds were further characterized by melting point values, IR, <sup>1</sup>H & <sup>13</sup>C-NMR spectra. This is a clean reaction using amla juice as a catalyst in a green approach to sustainable organic synthesis.

**Keywords:** Acylation, amla fruit extract (AFE), green catalyst, sustainable reaction, substituted aromatic anilines.



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1. [https://www.indigoherbs.com/indigo-herbs/indigo-herbs/benefits-public/Amla-739w\\_1.jpg?width=764&height=512](https://www.indigoherbs.com/indigo-herbs/indigo-herbs/benefits-public/Amla-739w_1.jpg?width=764&height=512)
2. <https://i.pinimg.com/736x/44/16/4416a6616eb7b735962a425a4251.jpg>
3. <https://images.unsplash.com/photo-2019-Dex-benefits-amlas-2019.jpg>

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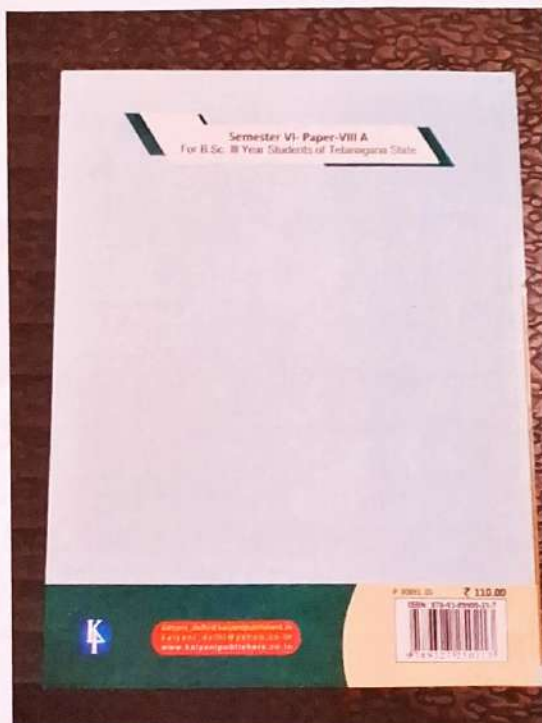
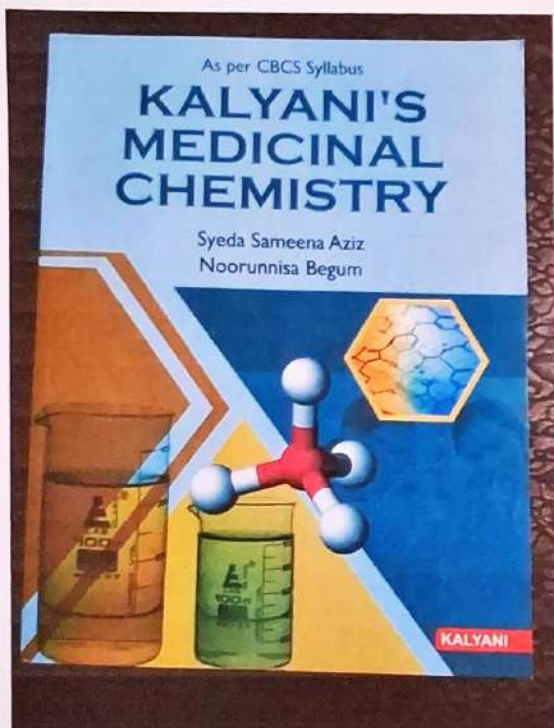
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Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January, 2023)

## An Efficient Greener Acylation of Few Substituted Aromatic Anilines Using Dragon Fruit Extract as a Catalyst

Noorunnisa Begum<sup>1</sup>, Syed Maher Shareef<sup>2</sup>, Syeda Sameena Aziz<sup>1</sup>

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### Abstract

For the last few years natural fruit extracts are increasingly being used in organic synthesis for their sustainable & safety aspects towards the environment. Keeping the importance of greener approach in chemistry we selected the dragon fruit extract as an efficient greener catalyst for the acylation of few substituted aromatic anilines such as 2-nitro aniline, 4-nitro aniline, D-sulfanilic, P-sulfanilic and P-sulfanilic using isopropyl alcohol as a green solvent and acetyl chloride as an acylating agent. The acylated compounds using dragon fruit extract as catalyst are obtained in high yields. The acylated compounds are characterized by their melting points, IR values, IR & <sup>1</sup>H-NMR values. Mild conditions, simplicity and easier workup are the main prospects of our acylation reaction using green catalyst.

**Keywords:** Substituted aromatic anilines, green solvent, sustainable acylation, green chemistry and Dragon fruit extract (DFE).

### Introduction

Making chemistry safer for its practitioners has been of major importance in relatively recent times. Natural substances are increasingly being used as a catalyst in the synthesis of organic compounds for their safety aspects towards the environment. Application of eco-friendly procedures has created a new path towards green chemistry by using the natural resources.<sup>[1-7]</sup> Keeping this in view we used Dragon fruit's pulp's extract as a catalyst in the acylation of a few selected substituted aromatic anilines. We chose anilines because of their simple structure and versatile nature to be used as starting material for finer chemical synthesis. N-acylation of amines also provides an efficient and low cost means to protect their amine groups in a multi acetyl organic process.<sup>[8]</sup> This process is carried out by reacting amines with reagents containing acyl group (acetyl chloride and acetic anhydride) in the presence of acid and basic catalysis, the use of catalysts such as KI-Al<sub>2</sub>O<sub>3</sub>,<sup>[9]</sup> ZnO,<sup>[10]</sup> Sodium formate<sup>[11]</sup>, Amberlite IR, O<sup>[12]</sup>, FeCl<sub>3</sub>,<sup>[13]</sup> Al(OH)<sub>3</sub>,<sup>[14]</sup> TiCl<sub>4</sub>(OTf)<sub>3</sub>,<sup>[15]</sup> BiOCl, CF<sub>3</sub>,<sup>[16]</sup> anhydrous NiCl<sub>2</sub>,<sup>[17]</sup> and iodine<sup>[18]</sup> have been reported for the N-acylation under various conditions. However, many of these methods suffered from various drawbacks such as long reaction time, tedious process and high cost. Keeping this in view the present method was adopted for minimizing the above said negative impacts wherein

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ISSN: 078-51-0044-30-4

Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January, 2023)

we have developed eco-friendly N-acylation reaction which is an environmentally benign approach towards the synthesis of chemo selective and N-acylated compounds using natural product. Pure extract of dragon fruit (PEDF) as an acid catalyst whose pH is reported as 4.8. The N-acylation of amines is carried out with acylating agents such as acetyl chloride and acetic anhydride.

### Experimental Method

#### Preparation of Catalyst

A ripened Dragon fruit (*Selenicereus imbricatus*) was obtained from a supermarket. The fruit was peeled and its pulp was chopped into small pieces and mashed. With the help of a strainer rest of the juice was extracted from the pulp. Process yielded 70 ml of pure extract. The extract was stored in a refrigerator to maintain its freshness and for further use.

#### Procedure for Acylation

To a mixture of substrate (1 mmole) acylating agent, acetic anhydride/acetyl Chloride (1.2 mmol), 2 ml of PEDF (Pure extract of dragon fruit) is added and stirred at room temperature for 2 minutes (Scheme 1 and 2 respectively).

#### Scheme 1



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Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January, 2023)

## Amla Fruit Extract Catalysed Green and Sustainable Acylation of Some Selected Substituted Aromatic Anilines

Neeraj Kumar Duggari, Mohd Asif Ali, Syedfa Taharweena Aziz  
Department of Chemistry, Anwarul Uloom College, Mallepally, Hyderabad  
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### Abstract

Green chemistry has recently emerged as a significant and sustainable technique in organic chemistry to create safe pathways for synthesizing pharmacologically active organic molecules. As the fruit juices are easily available, cheap, and can be easily extracted, we selected Amla fruit extract as an efficient green catalyst for acylation of some substituted aromatic anilines to anil-2-amine, 4-amine aniline, 3,4-diaminodiphenylamine, and pyrimidine. This work provided the acylated products of the above-mentioned compounds in good yield. The acylated compounds were further characterized by melting point values, IR & NMR values. This acylation reaction using amla juice as a catalyst is a good approach to sustainable organic synthesis.

**Keywords:** Acylation, amla fruit extract (AFE), green catalysis, sustainable synthesis, substituted aromatic anilines.



DOI: 10.26434/chemrxiv-2023-12345

Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January, 2023)



- <https://www.researchgate.net/publication/368123456>
- <https://doi.org/10.1002/chemrxiv-2023-12345>
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Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January, 2022)

## An Efficient Greener Acylation of Few Substituted Aromatic Anilines Using Dragon Fruit Extract as a Catalyst

Noorunnisa Begum<sup>1</sup>, Syed Maher Shareef<sup>1</sup>, Syeda Sameena Aziz<sup>1</sup>

<sup>1</sup>Department of Chemistry, Anwarul Uloom College, Malloppally, Hyderabad, TS - 506001, India.  
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### Abstract

For the last few years natural fruit extracts are increasingly being used in organic synthesis for their sustainable & safety aspects towards the environment. Keeping the importance of greener approach in chemistry we selected the dragon fruit extract as an efficient greener catalyst for the acylation of few substituted aromatic anilines such as 2-amino aniline, 4-amino aniline, O-toluidine, P-toluidine and P-methoxy aniline using acetyl chloride as a green solvent and acetic anhydride as an acylating agent. The acylated compounds using dragon fruit extract as catalyst are obtained in high yields. The acylated compounds are characterized by their melting points, IR values, IR & <sup>1</sup>H NMR values. Mild conditions, simplicity and easier workup are the main protocols of our acylation reaction using green catalyst.

**Keywords:** Substituted aromatic anilines, green solvent, sustainable acylation, green chemistry and Dragon fruit extract (DFE).

### Introduction

Making chemistry safer for its practitioners has been of major importance in relatively recent times. Natural substances are increasingly being used as a catalyst in the synthesis of organic compounds for their safety aspects towards the environment. Application of eco-friendly procedures has created a new path towards green chemistry by using the natural resources.<sup>1-3</sup> Keeping this in view we used Dragon fruit's pulp's extract as a catalyst in the acylation of a few selected substituted aromatic anilines. We chose anilines because of their simple structure and versatile nature to be used as starting material for finer chemical synthesis. N-acylation of amines also provides an efficient and low cost means to protect their amine groups in a multi-step organic process.<sup>4-7</sup> This process is carried out by reacting amines with reagents containing acyl group (acetyl chloride and acetic anhydride) in the presence of acid and basic catalysts, the use of catalysts such as KF·Al(O)<sub>2</sub>, ZnO,<sup>8</sup> Sodium formate,<sup>9</sup> Amberlite IR, O<sub>2</sub>, FeCl<sub>3</sub>,<sup>10</sup> Al(Ot)<sub>3</sub>,<sup>11</sup> TiCl<sub>4</sub>(OTf)<sub>2</sub>,<sup>12</sup> B(OEt)<sub>3</sub>,<sup>13</sup> anhydrous SnCl<sub>4</sub><sup>14</sup> and iodine<sup>15</sup> have been reported for the N-acylation under various conditions. However, many of these methods suffered from various drawbacks such as long reaction time, tedious process and high cost. Keeping this in view the present method was adopted for minimizing the above said negative impacts wherein

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ISSN: 075-93-9544 30.4

Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January, 2022)

We have developed eco-friendly N-acylation reaction which is an environmentally benign approach towards the synthesis of chemo-selective and N-acylated compounds using natural product. Pure extract of dragon fruit (PEDF) as an acid catalyst whose pH is reported as 4.8. The N-acylation of amines is carried out with acylating agents such as acetyl chloride and acetic anhydride.

### Experimental Method

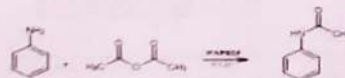
#### Preparation of Catalyst

A ripened Dragon fruit (*Selenicereus undulatus*) was obtained from a supermarket. The fruit was peeled and its pulp was chopped into small pieces and mashed. With the help of a strainer rest of the juice was extracted from the pulp. Process yielded 70 ml of pure extract. The extract was stored in a refrigerator to maintain its freshness and for further use.

#### Procedure for Acylation

To a mixture of substrate (1 m mole) acylating agent, acetic anhydride/acetyl Chloride (1.2 m mol), 2 ml of PDEF (Pure extract of dragon fruit) is added and stirred at room temperature for 2 minutes (Scheme 1 and 2 respectively).

#### Scheme 1



#### Scheme 2



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Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January, 2023)

## Amla Fruit Extract Catalysed Green and Sustainable Acylation of Some Selected Substituted Aromatic Anilines

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<sup>1</sup>Department of Chemistry, Anwarul Uloom College, Mallepally, Hyderabad  
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### Abstract

Green chemistry has recently emerged as a significant and sustainable technique in organic chemistry to create safe products via ecofriendly processes using renewable organic molecules. As the fruit wastes are easily available, cheap, and can be easily converted into natural acids that contain an efficient green catalyst for acylation of some substituted aromatic anilines viz. *m*-nitro aniline, *p*-nitro aniline, chlorobenzene, *p*-Toluidine and *p*-anisidine. This work produced the acylated products of the above mentioned compounds in good yield. The acylated compounds were further characterized by melting point values, IR & NMR values. This acylation reaction using amla juice as a catalyst is a green approach to sustainable organic synthesis.

**Keywords:** Acylation, amla fruit extract (AFE), green catalyst, sustainable reaction, substituted aromatic anilines.



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ISBN: 978-81-95044-01-7

Proceedings of the National Conference on "Recent Advances in Green and Sustainable Chemical Sciences" (20<sup>th</sup> & 21<sup>st</sup> January, 2023)



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