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# Dr. ASHWEENDEEPAK NANNAWARE

(CSIR-CIMAP Profile: <http://staff.cimap.res.in/show.aspx?empid=183>)

**OBJECTIVE**

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To acquire knowledge and contribute in chemical and biomedical sciences for welfare and enhancement in life standards of human being

**EXPERIENCE**

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**18<sup>th</sup> Feb 2021 - Till date CSIR-Central Institute of Medicinal And Aromatic Plants  
Lucknow (UP), India****▪ Principal Scientist**

My research in CSIR-CIMAP specially focuses on utilization of renewable resources for the development of new process intensification technologies for distillation and bio-chemicals production for the benefit of Indian farmers.

**Project handled:**

1. Design and development of centralized hybrid solar aroma distillation unit (500 Kg capacity) for enabling poor and marginal farmers cultivating aromatic crops in India" (152.16 Lakhs: CSIR funded)- Ongoing.
2. Enhancement of tribal farmers income through cultivation and processing of aromatic crops suitable for aspirational district of Nandurbar region in Maharashtra (113.28 Lakhs: DBT funded)-ongoing
3. Synthesis of levulinic acid from spent biomass of aromatic crops by green process" (22 Lakhs: DBT funded) - Completed.
4. "Aroma mission project: Research and Extension activities in drought prone Vidarbha, Maharashtra for farmer's income enhancement through aromatic crops cultivation"(CSIR mission project)-Ongoing

**Contributions / outcome:**

Complete list of patents, publication and book chapter has been provided in Annexure I.

**04<sup>th</sup> Dec. 06 - 30<sup>th</sup> June 07 Solid Petroleum Refinery, Mumbai (MH)****▪ Production and Technical In-charge****Work responsibilities:**

Coordinate with research and maintenance team of bitumen plant, Plan various process activities and allocate the job to factory workers according, Monitoring the preparation of raw material as per the BIS specification, Daily performance monitoring of bitumen plants, Carrying out testing quality analysis and grading of various bitumen sample as well as inspection as support to manufacture activities, Monitoring inventory and raw material consumption, Monitoring samples of various grades of polymer bitumen and finished product, Trouble shooting during the manufacturing process of Polymer Modified Bitumen, Emulsion, Blown Grade Bitumen, Penetration Grade Bitumen etc., Record keeping of all the batches related details, making yield statement and final product specification as per the BIS standard.

**17<sup>th</sup> July 06 - 30<sup>th</sup> Nov. 06 Central Pulp and Paper Research Institute, Saharanpur (UP)**

▪ **Junior Research Fellow (JRF)**

**Research & Development Activities:**

1. Worked as Juniors Research fellow in "Chemical recovery and Energy Management Division" in Central Pulp and Paper Research Institute (Saharanpur). My project was based on "Implementation of Energy Conservation Act" sponsored by "Indo-German Energy Program".
2. I was also a team member of "Energy Audit Team" which is used to conduct Energy Audit in various pulp and paper mills.

**Energy Audit Activities:**

We have conducted energy audit of various paper mill like Hindustan Paper Corporation Limited (Silchar and Nagoan, Assam), BILT (Yamunanagar, Haryana) and Mysore paper mill (Bhadravati).

**10<sup>th</sup> Aug.05 - 10<sup>th</sup> Jul. 06 Solid Petroleum Refinery, Mumbai, (MH)**

▪ **Production Engineer**

EDUCATION

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**2007-2009 Institute of Chemical Technology (erstwhile UDCT) Mumbai**

**Master of Chemical Engineering (First Class;Thesis Grade: A)**

▪ **Research Topic : CFD Analysis of Fluid System**

▪ Research Supervisor : Professor A.W. Patwardhan

- The project mainly emphasizes on the study of flow phenomenon, heat transfer and mass transfer in meso-channel reactor for Methane Steam Reforming and Ethanol Steam reforming. It was investigated with the commercial software package FLUENT and GAMBIT. The simulation includes gas phase reaction in meso-channel.

▪ **Seminar Topic : Kinetics of anaerobic digestion of biomass**

▪ Seminar Supervisor : Professor S S Bhagwat

- This study examined the kinetics of anaerobic digestion for the treatment of the organic fraction of various solid wastes. Anaerobic Digestion (AD) produces mainly 55% methane and 45% carbon dioxide and a compost product suitable as a soil conditioner. The report also compares various AD systems such as mesophilic vs. thermophilic operation, low solid vs. high solid feed, multi stage vs single stage reactor.

**2001- 2005 University Department of Chemical Technology (U.D.C.T.) Amravati**

**Bachelor of Chemical Technology(First Class;Thesis Grade: A)**

▪ Project Topic : Study of membrane separation

▪ Project Supervisor : Professor V. S. Sapkal

**2003 Vidhya Bharti Mahavidhyalay Amravati**

▪ Higher Secondary Certificate Class: First

**1999 Golden Kids English High School Amravati**

▪ Secondary School Certificate Class: First

## SCHOLASTIC ACHIEVEMENTS, PRESENTATION AND COMPETITION

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- **First prize** in solving "L & T company" problem on "**Development of process flow diagram for Fisher-Tropsch Synthesis**" in "Young Innovators Choice Competition", 23<sup>rd</sup> - 26<sup>th</sup> Jan. 09, UDCT, Mumbai.
- GATE qualified (2007)
- **First prize** in "**Poster Presentation**" at National Science Day-2005 conducted by Amravati University, Amravati, 2005

## COMPUTER SKILLS

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**Language** : Basic and beginner in C++

**Operating Systems**: DOS, Windows 98, NT, XP

**Application Software**: ANSYS CFD= "GAMBIT, FLUENT", MS Office

## SPORTS & HOBBIES

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Badminton, Cricket, Table Tennis, Carom

## EXTRA CURRICULAR ACTIVITIES

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- Runner-up in 46<sup>th</sup> SSBMT tournament of CSIR @ NCL pune, 2015.
- Winner of CSIR-CDRI Badminton (Singles) Diamond Jubilee Tournament, 2011.
- Sport secretary during PG in UICT, 2007-2008.
- Runner up in State level Badminton tournament 2000.
- Organizer of one day workshop on 28<sup>th</sup> Jan. 2011 under the theme "Chemistry of biologically active compounds"

## PERSONAL INFORMATION

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- Date of Birth : April 13, 1983 35 yrs
- Marital Status : Married
- Languages Known: English, Hindi, Marathi
- References : Prof. Ram Rajasekharan  
Director  
CSIR-Central Food Technological Research Institute,  
Mysore  
Email ID: [lipidindia@yahoo.com](mailto:lipidindia@yahoo.com);

Prof. A V Patwardhan  
Professor of Chemical Engineering,  
Institute of Chemical Technology (erstwhile  
UDCT) Mumbai-400 019  
Email ID: [av.patwardhan@ictmumbai.edu.in](mailto:av.patwardhan@ictmumbai.edu.in)

## Annexure – I (List of patients, publication and invited lecturer from 2010 - till date)

### Patents:

1. Patent No.202311001655. "Multifunctional Decentralized Mobile Solar Distillation Unit for Essential Oil Extraction" **Ashween Deepak Nannaware\***, Prasant Kumar Rout, C. S.chanotiya, Suman Singh, Manglesh Kumar Gupta, Ankit V. Deorankar and Rajesh Kumar Verma
2. 2020110468IN. "Process for isolation of ricinoleic acid/ester from castor oil and its biotransformation of ricinolic acid/ester to gamma-dacalactone using candida parapsilosis". P K Rout, Alok Kalra, C S Chanotiya, **Ashween Deepak Nannaware**, Anil Kumar Tripsathi, Rachna Singh, A Jain, S Nazia
3. 2020110468IN. "Process for isolation of ricinoleic acid/ester from castor oil and its biotransformation of ricinolic acid/ester to gamma-dacalactone using candida parapsilosis". P K Rout, Alok Kalra, C S Chanotiya, **Ashween Deepak Nannaware**, Anil Kumar Tripsathi, Rachna Singh, A Jain, S Nazia
4. 0149NF2017. "Solar distillation apparatus for extraction of essential oil". **Ashween Deepak Nannaware\***, C S Chanotiya, P K Rout, Prem Singh
5. WO/2016/088139 2016. "An eco-friendly process for the isolation of biopolymers from agricultural residues". P. K. Rout, **Ashween Deepak Nannaware**, Om prakesh and R. Rajasekharan.
6. US20140350271 2015 (GD). "Green process and catalyst for conversion of cellulose from aromatic biomass waste to hydroxymethyl furfural". P. K. Rout, **Ashween Deepak Nannaware**, and R. Rajasekharan.

### Papers:

1. Ch. Mohan Sai Kumar, Suman Singh, Manglesh Kumar Gupta, Yogesh M. Nimdeo, Ravi Raushan, Ankit V. Deorankar, T.m. Ananda Kumar, Prasant Kumar Rout, C.s.chanotiya, Vinod D. Pakhale, **Ashween Deepak Nannaware\*** "Solar energy: A promising renewable source for meeting energy demand in Indian agriculture applications", Sustainable Energy Technologies and Assessments, Volume 55, February 2023, 102905. 2023. (<https://doi.org/10.1016/j.seta.2022.102905>)
2. **Ashween Deepak Nannaware\***, Ch Mohan Sai Kumar, Shubham Srivastava, Suman Singh, Manglesh Kumar Gupta, Prasanta Kumar Rout, C.s.chanotiya, R.k.lal, Yogesh Nimdeo, Saumendu Roy "Eco-friendly solar distillation apparatus for improving the yield of essential oils with enhancing organoleptic characteristics", Renewable Energy, Volume 191, May 2022, Pages 345-356. 2022. (<https://doi.org/10.1016/j.renene.2022.03.147>)
3. Deepak Kumar, Praveen Kumar Sharma, Om Prakash, Shivani Chaturvedi, Suman Singh, Ch Mohan Sai Kumar, **Ashween Deepak Nannaware**, Alok Kalra, Prasant Kumar Rout "Green solvent system for isolation of biopolymers from Mentha arvensis distilled biomass and saccharification to glucose for the production of methyl levulinate", Renewable Energy, Volume 194, July 2022, Pages 448 -458. 2022. (<https://doi.org/10.1016/j.renene.2022.05.098>)
4. Naziya Syed, Suman Singh, Shivani Chaturvedi, **Ashween Deepak Nannaware**, Sunil Kumar Khare & Prasant Kumar Rout, "Production of lactones for flavoring and pharmacological purposes from unsaturated lipids: an industrial perspective", Critical Reviews in Food Science and Nutrition. 2022. (<https://doi.org/10.1080/10408398.2022.2068124>)
5. Om Prakash, Malaya Naik, Rajesh Katiyar, Satya N Naik, Deepamala Maji, Anugrah Shukla, **Ashween Deepak Nannaware**, Aolk Kalra, P K Rout; Novel pretreatment process improved the glucan conversion from distilled Mentha arvensis biomass, Industrial Crops and Products, Vol 119, pages 1-8, September 2018

6. P. K. Rout, **A. D. Nannaware**, Om Prakesh, Alok Kalra and R. Rajasekharan. Synthesis of hydroxymethylfurfural from cellulose using green processes: A promising biochemical and biofuel feedstock. Chemical Engineering Science Vol 142, pages 318-346, March 2016.
7. O. Prakesh, S. A. Siddiqui, A. Shukla, A. Yadav, **A. D. Nannaware**, C. S. Chanotiya, P. K. Rout, Synthesis of hydroxymethylfurfural from fructose, J. Bioresour. Eng. Technol, 2015, 2:1 -7.
8. P. K. Rout, **A. D. Nannaware**, Om Prakesh and R. Rajasekharan. Depolymerisation of cellulose and synthesis of hexitols from cellulose using heterogeneous catalysts. ChemBioEng Reviews Vol 1, Issue 3, pages 96-116, June 2014.

#### **External Invited Lecture in India :**

1. Delivered an **invited keynote lecture** on **4<sup>th</sup> March 2023** at the Residential Trainina Proaram on the theme "Hazardous substances/ Solid waste/ Bio -medical/ Electronic/ Plastic waste/C & D waste management/ Environment" organized by **IIT JAMMU**
2. Defense Institute of Bio-Energy Research, Haldwani (DRDO, Govt of India) on "Lignocellulosic material degradation using catalyst" on 3<sup>rd</sup> December 2012.