NATIONAL WEBINAR

On

CIRCULAR ECONOMY APPROACH FOR MITIGATION OF PLASTIC WASTE

Challenges, opportunities and future prospects

7th October 2024

IN HYBRID MODE

Organized by

INDIAN INSTITUTE OF CHEMICAL ENGINEERS
AMARAVATI REGIONAL CENTRE
JKC College Campus, Ring Road
GUNTUR-522 006 (AP)
In Association with all Student Chapters under ARC

Hosted by

IIChE- STUDENT CHAPTER
NATIONAL INSTITUTE OF TECHNOLOGY ANDHRA PRADESH

ABOUT IIChE

Indian Institute of Chemical Engineers (IIChE) is a confluence of streams of professionals from academia, research institutions and industry. It provides an appropriate forum for joint endeavors, hand-in-hand, to work for enhancement of knowledge and development of necessary skills through application of Chemical Engineering and allied sciences contributing to sustainable development of the society. To those interested in or involved in Chemical and allied Engineering activities, programmes of IIChE are expected to be immensely beneficial, opening up new horizons in their careers.

ABOUT IIChE ARC

The Amaravati Regional Centre (ARC) of Indian Institute of Chemical Engineers (IIChE) was established in the year 2015 to promote Chemical Engineering activities in the region. Among lofty aims of establishing Industry-Professional body relationship and improving competency of budding engineers, IIChE ARC strives to promote the importance of Chemical Engineering among public.

The centre is aiming to play an important role in the growth of Chemical Industry in the region, by creating awareness about the latest technological developments in the field of Chemical Engineering. The centre also promotes the activities of student chapters of Chemical and Allied Engineering in this region. The Centre has been bestowed three times with the best regional center award in 2017, 2020 & 2022 and three times the second best award in 2018, 2021 & 2023 under "B" category centers for its dynamic & proactive activities.

ABOUT IIChE-STUDENT CHAPTER NIT ANDHRA PRADESH

The IIChE-Student Chapter NIT Andhra Pradesh was established in 2018 at National Institute of Technology Andhra Pradesh to motivate and involve students in Chemical Engineering activities. Student chapter-NIT Andhra Pradesh works to spread knowledge of chemical processes, industries, and engineering responsibilities among students. Overall it aids students holistically for becoming a skilled Chemical Engineer. The chapter organizes seminars, symposiums and workshops throughout the year by bringing experts from industry and academia for the development of the students. Moreover, students get the organizing experiences through involving in these events as an active part of organizers.

ABOUT THE WEBINAR

The global consumption of plastics has been increasing over the years, particularly because they are lightweight, resilient, relatively low-priced and long-lasting. The plastic industry produced approximately 300 million tons of plastics in 2020. Of the total quantity of plastic waste generated, only 7% is recycled, about 8% is incinerated and the residual is landfilled.

In the landfilling process, toxic chemicals leach out causing degradation of soil while incineration produces CO, CO_2, oxides of N_2, SO_2 and other toxic gases causing air pollution and global warming. To limit the global warming and achieve carbon neutral by 2050 or so, it is necessary to reduce the consumption of petroleum and other fossil related raw materials for the production of plastics and energy and replace to certain extent by renewable sources. Therefore, to meet the growing consumption of plastics and sustainable environmental material usage in the near future, it is high time that the circular economy approach needs to be developed and plastics must be recycled or reprocessed to avoid problems in landfills, emission of greenhouse gases and reduce the production of virgin polymers.

India's Recycling Landscape

India's consumption of plastics is estimated at over 16 million tons annually. However, inadequate waste management systems lead to approximately 26,000 tons of plastic waste being generated daily, of which only a fraction is recycled. Much of this plastic waste ends up in landfills, water bodies, and oceans, causing severe environmental degradation and health hazards. Recognizing the urgency of addressing plastic pollution, the Indian government has implemented several initiatives to promote sustainable plastic recycling: a) Established the Waste to Wealth Mission in 2021 to leverage science, technology, and innovation to create financially viable and

sustainable circular economy models. b) Amendments to the Plastic Waste Management Rules in 2022 to tackle plastic waste and move towards a more circular economy for plastics. c) Amendments to the Extended Producer Responsibility (EPR) guidelines which will drive market demand for good quality recycled plastics These regulatory changes have set clear targets to drive up the use of recycled content in packaging and eliminate single-use plastic packaging. The market for recycling plastic waste in India reached 9.9 million tons in 2023. It is projected that by 2032, this figure could rise significantly to 23.7 million tons.

Over the last two decades or so, several studies have suggested alternatives to the conventional petroleum-based plastics. One such alternative is bioplastics, which are polymeric compounds that are both functionally like synthetic plastics and largely environmentally sustainable. A variety of bioplastics have been developed to address environmental issues associated with conventional petroleum-derived plastics and found that some bio-based plastics cannot be recycled and end up in landfills, which decompose gradually and produce methane gas. Further, the bioplastics may not replace petroleum based plastics for all applications. For these reasons, people are starting to believe that bioplastics should be used only where suited, with tailor-made properties. Studies show that the drawbacks associated with bioplastics are less severe when compared to conventional plastics. In order to confirm the eco-friendliness of new bioplastics, future studies need to be conducted through Life Cycle Assessments (LCAs) and Land Use Change (LUC) analyses to determine whether the use of new-generation bioplastics is indeed beneficial to the environment and become alternative to the virgin polymers based on petroleum.

In this one-day webinar, to motivate the students to take active part and engage them in the proposed topic, a special session is allotted for amateur students to speak on the proposed topic. Technical papers are invited from the students and a selective number of students will be invited for oral presentation based on the merit of the papers submitted by them.

In this webinar, the lectures by the distinguished speakers are expected to cover the various mechanical/chemical technologies currently available for reuse of recycled plastics, the status of advanced recycling technologies to convert back recycled plastics into their basic components and challenges to overcome the obstacles, priority areas for research and innovation, strengthening waste management systems and creating awareness among all the stakeholders, the government policies, guidelines, strategies, specific goals, timelines, incentives and investment opportunities etc. for the circular economy related to plastics. Further the scope of sustainable bioplastics as alternative to the conventional petroleum based plastics is expected to be covered. It is expected that the series of expert lectures by the distinguished speakers will certainly create awareness and motivate, especially the student community to contribute towards sustained environment for the benefit of all living beings.

ORGANIZING COMMITTEE

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INFORMATION TO THE STUDENTS PARTICIPANTS FOR PAPER PRESENTATION COMPETITION

Selection of the Papers

1. The students participating in the competition should submit an extended abstract on any sub-topic related to the main theme of the webinar.
2. The Extended Abstracts will be screened by a committee and a selective number of papers will be invited for oral presentation by the student authors.
3. The last date for submitting Extended Abstract : 21st September, 2024.
4. The acceptance of a paper selected for oral presentation based on the Extended Abstract will be intimated to the student authors

by 25th September, 2024. The oral presentation should be made by the student authors only.

5. A maximum of two student authors are permitted per paper.
6. The full paper should be submitted by the student authors on or before 2nd October, 2024.
7. Cash prizes and Certificates of Merit will be given to he 1st, 2nd and 3rd positions in the paper presentation category. Other students in this category will be given “Certificate of Participation and Presentation” of the papers.
8. The students who submitted Extended Abstract within the prescribed last date but not selected for oral presentation are also permitted to submit the full papers. The students who submit the full papers on or before 2nd October 2024 will be given “Certificate of Participation in the Competition” and two consolation prizes for best papers in this category.
9. All other participants will be given Certificate of participation in the webinar.

GUIDELINES TO THE AUTHORS

Extended Abstract

Title : The title of the paper should be brief and informative.
Author: Name, course, year of study, email and college affiliation, mobile number should be given below the title.
Text: The extended abstract, not exceeding 300 words, should cover a brief introduction, relevance of the topic to the current needs of the society, the objective and state of affairs on the sub-topic, and finally conclusions. If the sub-topic chosen is related partly or fully to the internship or any training in any company, or a project work, please mention the details highlighting them at the beginning of the text both in abstract and full paper.
References: The important sources of reference of scientific/technical papers/ reports should be numbered in the extended abstract and those references must be listed at the end of the extended abstract. The limit of 300 words does not apply to the list of references.

Digital Copy: The extended abstract should be typed with a font size of 12 in Times New Roman having a line space of one and half in Microsoft word.

Full Paper

Please note that the papers selected based on the extended abstract will be permitted for oral presentation. However, all the students participating in the competition are encouraged to submit full papers. Please refer S.No.8 under the heading “Selection of the Papers” for clarity.
Title: The title of the full paper is expected to be identical as that of the extended abstract.
Author: The details of the authors as given in the extended abstract should be mentioned below the title.
Text: The text should cover introduction, objective of the work, literature review on sub-topic chosen, your own experimental/theoretical work if any, summary and conclusion. All the tables and figures should have captions with numbers in Arabic numerals (Ex: Fig. 1 or Table.1 followed by caption) and refer the Table or Figure numbers in the text wherever required. The books, scientific journals, reports etc referred to collect the information should be referred sequentially in the text writing Arabic numerals in parenthesis, ex: (1), (2) etc. Keep the same number given to a particular report or journal paper if that report or journal referred again.
References: All the reports, journal papers, books you referred to collect the information and numbered in the text should be listed sequentially at the end of the text in standard form shown below: 1. Carberry, J R and Bridgewater J, Chem. Eng. Sci, 22, 1516 (1967) 2. Levenspiel O, Chemical Reaction Engineering, P. 269, John Wiley and Sons, Inc. N.Y. (1967)
Digital Copy: The full paper should be typed with a font size of 12 in Times New Roman having a line space of one and half in Microsoft word.

ORAL PRESENTATION

1. Student authors will be given 12 minutes time for oral presentation followed by questions and answers for about 3 minutes.
2. Care must be taken by the authors to prepare the slides in M.S. Power Point such that they are clearly visible to the audience at a reasonable distance.
3. The students presenting the papers are encouraged to deliver the talk spontaneously instead of reading from the slides.

ELIGIBILITY

1. UG, PG and Research students of Chemical Engineering & allied branches including Chemistry are eligible for participation and submission of papers.
2. Teaching Faculty and Working professionals are eligible for participation.

CONTACT US

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INAUGURAL SESSION :: 07.10.2024 (Monday)

(09:30 am to 10:30 am)

INAUGURAL FUNCTION	GUESTS	INAUGURAL FUNCTION	GUESTS
Chief Guest 	**Prof. B S Murthy** **Patron** Officiating Director, NIT Andhra Pradesh National Institute of Technology, Andhra Pradesh Tadepalligudem, Andhra Pradesh 534101	Guest of honour 	**Prof. N. Balasubramanian** **Honorary Treasurer, IIChE** Department of Chemical Engineering AG Tech, Anna University Chennai 600025 [Mobile]: 9444954151 Email: nbs.bala@gmail.com
Chief Guest 	**Smt. Sheela** **Vice President, IIChE** Former Deputy Chief Executive Nuclear Fuel Complex, Hyderabad Plot Number 3/208, 7th Cross west Hastinapur Colony, Hyderabad-500094 [Mobile]: 9440587828 Email: sheela2490@gmail.com	Guest of honour 	**Mr. Dhawal Saxena** **Honorary Registrar, IIChE** CEO & CTO, Bhumistha Infra Services E 17, RH 4, Sector 6 Vashi, Navi Mumbai - 400703 [Mobile]: +91 9323363077 Email: dhawal_saxena@hotmail.com
10:30 am to 10:50 am	**Tea Break**		
MORNING SESSION : SPEAKERS			
10:50 am to 11:50 am 	**Dr. Suneel Pandey, Ph.D.** **Director** Circular Economy and Waste Management Division The Energy and Resources Institute (TERI) India Habitat Centre, Lodhi Road, New Delhi 110 003 Email: spandey@teri.res.in **Title:** Plastic Waste Management in India with reference to single use plastics	11:50 am to 12:50 am 	**Dr. Prakash P. Wadgaonkar, Ph.D.** **Emeritus Scientist** Polymer Science and Engineering Division CSIR-National Chemical Laboratory Dr. Homi Bhabha Road, Pune 411008 Email: pp.wadgaonkar@ncl.res.in **Title:** The Greening of Synthetic Polymers: Myths or Reality

AFTERNOON SESSION : SPEAKERS

02.00 pm to 02.30 pm 	**Dr. Gourhari Chakraborty** Department of Chemical Engineering National Institute of Technology, Andhra Pradesh Tadepalligudem, Andhra Pradesh 534101 Email: gourhari115@gmail.com **Title:** Sustainable Polymers: Reduction of Plastic Wastes	03:00 pm to 04:00 pm 	**Dr. Sanat Kumar, Ph.D** **Chief Scientist, Head** Upstream and Wax Rheology Division, CSIR-Indian Institute of Petroleum, Dehradun Email: sanat@iip.res.in **Title:** Chemical recycling of waste plastics-opportunities & challenges
02.30 pm to 03:00 pm 	**Dr. Mohanraj P** Department of Chemical Engineering National Institute of Technology, Andhra Pradesh Tadepalligudem, Andhra Pradesh 534101 Email: mhnrjcit@gmail.com **Title:** Application of polymers in electrochemical reduction for wastewater treatment	04:00 pm to 05:00 pm 	**Dr. Virendra Kumar Gupta, Ph.D.** **Head R&D, Polymer &** Senior Vice President Reliance Industries Limited Navi Mumbai, India Email: virendrakumar.gupta@ril.com **Title:** Circularity in Plastic Economy: Challenges and Opportunities

CONCLUDING SESSION :: 05:00 pm to 05:30 pm :

Event Link: *https://nitandhra.webex.com/nitandhra/j.php?MTID=m762cee1d3921e758922e087f869a5b0b*

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Website: http:/iichearc.org.in, Registration :: Free, Registration Link: https://forms.gle/MUG7K43Z5UEazNj27