

# Mahendra Chinthala

Phone no.: 9655575685 /Email: [mahendra.ch6@gmail.com](mailto:mahendra.ch6@gmail.com)



## Objective

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To Work in a meaningful and challenging position that enables me to develop myself as a professional and permit scope for advancement.

## Education

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2010- 2015	PhD, Chemical Engineering, Homi Bhabha National Institute, Mumbai, INDIA
2007-2010	M.Tech, Chemical Technology, Osmania University, Hyderabad. INDIA
2003-2007	B.Tech, Chemical Engineering, Sri Venkateswara University, Tirupathi, INIDA

## Experience

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- Worked as Temporary Faculty at National Institute of Technology, Trichy, Tamilnadu, INDIA from 27/07/15 to 28/0716.
- Worked as an Assistant Professor in the Department of Chemical Engineering, M.S. Ramaiah Institute of Technology, Bangalore, INDIA. (04/08/2016 TO 28/02/2020)

## Achievements

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- Junior and Senior Research Fellowships from Department of Atomic Energy for pursuing Ph.D.
- University Grants Commission Fellowship for pursuing M.Tech.

## Projects

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**Ph.D project-** “Separation of Cesium form simulated High Level Waste using Electrodialysis-Ionexchange”

**Research Supervisors:** Dr. P.M. Satya Sai and C. Anand Babu

**Place of research work:** Indira Gandhi Centre for Atomic Research, Kalpakkam, Tamilnadu, INDIA.

**Brief description of work done as a part of Ph.D (Chem. Engg.)**

Cs<sup>137</sup> is one of the predominant fission isotopes issuing in the High Level Waste (HLW) in nuclear reprocessing of spent fuel. Being radioactive in nature, Cs-137 finds application as a radioactive source in many industrial and medical applications. Obtaining Cs in pure form is essential for its application as radiation source. Reported technologies like precipitation, solvent extraction and ion exchange for Cs removal form HLW resulted in multi number of steps to obtain Cs in pure form. In order to overcome these difficulties, Electrodialysis-Ion exchange technology (EDIX) has been investigated for the separation of cesium from simulated HLW using AMP-PAN ion exchange resin.

Cesium from simulated HLW is passed through an ion exchange column containing (Cs selective ion exchange resin) which separates Cs from other fission products. Cs ion exchange kinetics on AMP-PAN were modelled both for batch and column experiments. The rate determining steps and order of reaction were determined. Column dynamic parameters like breakthrough, mass transfer zone, bed saturation, etc., were analyzed for different operating conditions.

In order to obtain pure form of Cs, the sorbed Cs on the AMP-PAN was recovered in an electro dialysis setup. On application of electric potential across the cell, Cs from AMP-PAN was replaced by ammonium ions from anode compartment. The eluted Cs from AMP-PAN migrated to cathode compartment and got concentrated. The parameters affecting the process like current density, eluant concentration etc., were studied for optimizing the process. Current-Voltage characteristics in the EDIX process for Cs recovery from AMP-PAN were studied and an empirical equation was proposed for the determination of limiting current in the process. Nernst- Plank model was applied to describe the process and model diffusion coefficients were determined for different conditions.

**M.Tech project-** “Distillation and analysis of Aromatic oil for pharmaceutical formulation”

**Research Supervisors:** Dr. P. Shashikala

**Place of research work:** University College of Technology, Osmania University, Hyderabad, INDIA.

**Brief description of work done as a part of M.Tech (Chem. Tech.)**

One of the aromatic oil (lemongrass oil) was steam distilled and separated its main component citral which constitute up to 85% and analyzed for its purity by gas chromatography. Ointments were prepared with the citral by incorporating the citral into the ointment bases then the ointments were evaluated for drug release by diffusion through gelatin layer and suggested a suitable base for maximum drug (citral) release in ointment formulation by studying the kinetics.

### ***Soft Skills***

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- Ms Office,
- Origin,
- Comsol Multiphysics,
- Matlab,
- ASPEN Plus

### ***Instrumentation***

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- Atomic Absorption spectrophotometer.
- UV-Visible Spectrophotometer

## *Journal publications*

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1. Ch.Mahendra, Suranjen Bera, C. Anand Babu, K.K. Rajan, Separation of cesium by Electrodialysis-Ion exchange using AMP-PAN, Separation Science and Technology, 48 (2013) 2473-2478.
2. Ch. Mahendra, P.M. Satya Sai, C. Anand Babu, Current -Voltage characteristics in EDIX for separation of cesium from AMP-PAN. Desalination 353 (2014) 8-14.
3. Ch.Mahendra, P.M. Satya Sai, C. Anand Babu, K.Revathy, K.K.Rajan, Analysis and modeling of fixed bed sorption of cesium by AMP-PAN, Journal of Environmental Chemical Engineering 3(2015) 1546-1554.
4. Ch.Mahendra, P.M. Satya Sai, C. Anand Babu, Different modes of electrodeionization of cesium from AMP-PAN, IJERT 5 (2016) 30-34.
5. Ch.Mahendra, P.M. Satya Sai, C. Anand Babu, K.Revathy, K.K.Rajan, Transport phenomena in electrodeionization of cesium from AMP-PAN, 52 (2017) 1468-1476.
6. H.B. Kruthi, H. Shreya, Ch. Mahendra, Methylene blue dye removal using saw palmetto fruit (*Serenoa repens*) waste, Asian Journal of Chemistry (2019) 31(9):1919-1925.
7. Ch. Mahendra, R.R. Sivakiran, K.A. Badrinarayana, Lakshmi Priya, Shivani Raj and M. Mamatha, Investigation of bivalve molluscan seashells for the removal of cadmium, lead and zinc metal ions from wastewater streams, Rasayan Journal of Chemistry, 13(2) (2020) 903-914.

## *Book Chapter*

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1. Ch.Mahendra, P.M. Satya Sai, C. Anand Babu, K.Revathy, K.K.Rajan “ Application of Thomas Model for ion exchange of cesium on AMP-PAN”, Chemical and bioprocess Engineering; Trends and Development, Apple Academic Press, Taylor and Francis Group (Chapter-12).

## *Conference proceedings*

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1. **Ch.Mahendra**, Suranjen Bera, C. Anand Babu, K.K. Rajan, Separation of cesium from simulated High Level Waste using Electrodialysis Ion exchange, SESTEC12, Mithibai College, Mumbai, Feb 27, 2012.
2. **Ch.Mahendra**, P.M. Satya Sai, C. Anand Babu, K.Revathy, K.K.Rajan, Application of Thomas Model for ion exchange of cesium on AMP-PAN, International Conference on Chemical and Bioprocess Engineering, NITW, Warangal, Nov 23, 2013.
3. **Ch.Mahendra**, P.M. Satya Sai, C. Anand Babu, K.Revathy, K.K.Rajan, Electrodeionization of cesium from AMP-PAN, CHEMCON13, ICT, Mumbai, Dec 27, 2013.
4. **Ch.Mahendra**, P.M. Satya Sai, C. Anand Babu, K.Revathy, K.K.Rajan, Intergration of Ion exchange and Electrodialysis for the separation of cesium form simulated High Level Waste, Interenational Conference on Innovative Technologies and Management for Water Security, NIOT, Chennai, Feb 12, 2014.

5. **Ch.Mahendra**, P.M. Satya Sai, C. Anand Babu, K.Revathy, K.K.Rajan, Effect of electrolytes concentration on recovery of cesium from AMP-PAN by Electrodialysis- Ion exchange (EDIX), SESTEC 14, BARC, Mumbai, Feb 25-28, 2014.
6. **Ch.Mahendra**, P.M. Satya Sai, C. Anand Babu, Different modes of electrodeionization of cesium from AMP-PAN, ICREAS 16, MSRIT, Bangalore, Sep 7 & 8, 2016.
7. Sandeep Sridhar, Sutripto K, **Ch. Mahendra**, Simulation of Reactive Distillation Column for Transesterification of Triglyceride to Fatty Acid Alkyl Esters, Schemcon 2017, NIT Rourkela,17-18 Oct, 2017.
8. Vamsi, Kizher, Shashank, Aravind, **Ch.Mahendra** , Heterogeneously Catalysed Methyl Tertiary Butyl Ether (MTBE) Synthesis- A Simulation Study, Schemcon 2017, NIT Rourkela,17-18 Oct, 2017.
9. Kruthi.H.B., Shreya.H, **Ch. Mahendra**, Adsorptive treatment of methylene blue dye using saw palmetto fruit waste as a low-cost adsorbent, International conference on Recent advancements in chemical, environmental and energy engineering, SSN College of Engineering, Chennai, 15-16 Feb 2018.
10. Pavithra Venkataraman, Manaswini Gowtham V, **Ch. Mahendra** , A review on advanced materials for degradation of organic wastewater, ICREAS 18, MSRIT, 26-27, Sep 2018.
11. Manaswini Gowtham V, Pavithra Venkataraman, **Ch. Mahendra**, Applications of MgO based nanocomposite materials, ICREAS 18, MSRIT, 26-27, Sep 2018.
12. Shreya.H, Kruthi.H.B, **Ch. Mahendra**, Simulation of different configurations of biomass gasification models using ASPEN PLUS, ICREAS 18, MSRIT, 26-27, Sep 2018.
13. Shreya.H, Kruthi.H.B, Divya.M, **Ch.Mahendra**, Pine wood gasification based on thermodynamic equilibrium model using aspen plus, IPACT-18, Annamalai University, 13, March, 2019.

### **Areas of Research Specialization**

- Separation technologies; Electrodialysis; Electrochemical separations; Ion exchange; adsorption; oxidation processes; hydrodynamic cavitation
- Gasification of biomass
- Chemical process simulation using ASPEN PLUS

### **Declaration**

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I hereby declare that all the above details furnished by me are true to the best of my knowledge.

(Mahendra Chinthala)