

DR.MS. SAI KESKAR

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D.O.B : 21st July 1983

EDUCATION

Chemistry, PhD **September 2007 – April 2011**
Queensland University of Technology, Brisbane, Australia.

Awarded post-graduate study at Queensland University of Technology, Australia. Pursued a Ph.D. in chemistry of biomass and ionic liquids.

Supervisors: Dr. Les Edye, Dr. William Doherty and Dr. John Bartley

Dissertation: A study of ionic liquids for dissolution of sugarcane bagasse (biomass).

Study of phosphonium and imidazolium ionic liquids for their ability to dissolve different components of sugarcane bagasse. Research involved understanding the chemistry of cellulose, lignin and hemicellulose dissolution in phosphonium and imidazolium ionic liquids, the influence of catalytic impurities in the ILs on the dissolution, FTIR study of biomass-ionic liquid reactions and characterization of dissolved and undissolved fractions using standard protocols.

Chemical Engineering, Bachelor of Engineering **August 2001 – August 2005**
Sinhgad College of Engineering, Pune, India.
First Class

EXPERIENCE

Technical Manager, November 2013 to present
Maarc Labs Private Limited, Pune.

Supervision and technical design of laboratory established for pesticide residue analysis under the grant-in-aid from the Food Ministry of India.

1. Method development and validation of GC/MS/MS, LC/MS/MS, HPLC/UV/FLD methods for APEDA, FSSAI and ISO-IEC 17025.
2. Training and sensitizing a team of 6 chemists to carry out method validation as per SANCO and IUPAC guidelines.
3. Validation of QueChers sample preparation method for analysis of pesticide residues in fruits and vegetables
4. Validation of triple quad LC/MS/MS (Waters Xevo TQD) and triple quad GC/MS/MS (Agilent 7000C) for the analysis of residual pesticides in fruits and vegetables.
5. Successful approval from NABL for additional scope (grapes, pomegranate, curry leaves and okra) for pesticide residue and heavy metals as per APEDA guidelines.
6. Successful approval from APEDA for residue analysis in export quality fresh fruits and vegetables.

7. Successfully carried out export analysis of grapes from 2017-2019.

Associate Staff Technologist, April 2013- October 2013
Praj Industries Ltd. (PrajMatrix Innovation Center, Pirangut, Pune)

Analytical Science Center (ASC) is a central analytical chemistry facility at Praj Matrix. It provides analytical solutions to 9 Centers of Excellence (COEs) which include Pilot Plant (biomass pretreatment), Co-fermentation, Animal feed and probiotics, Hydroxy Methyl Furfural production, Biodiesel. Projects undertaken so far:

1. Nisin production and scale up
 - a. Developing analytical methods for the analysis of Nisin by HPLC
 - b. Purity analysis of Nisin with market samples
 - c. Method development and analytical support during scale up for commercialization
 - d. Research paper in process
2. Lignocellulosic biomass to ethanol
 - a. Analytical support to the pilot plant using NREL characterization methods, spectroscopic and HPLC analysis of process intermediate for the estimation of plant performance and process efficiency
 - b. Research and report writing for feedstock availability and quality (statewise scenarios for India and global perspective)
 - c. Process trouble shooting and method validation using statistical analysis as well as analytical chemistry tools.

Post doctoral fellow, July 2011 – December 2012

Great Lakes Bioenergy Research Center, Michigan State University, Michigan, USA.

Post doctoral research under the guidance of Prof. Bruce Dale. Significant research work includes

1. Designing analytical methods for high throughput characterization of AFEX treated biomass
 - a. Determination of lignin in pretreated biomass
 - b. Determination of degradation products (ferulated and diferulates) produced during AFEX by LC/MS
 - c. Comparison of gravimetric and photometric methods for determination of lignin
 - d. Fundamental understanding of lignin oligomers by LC/MS
2. Characterization of lignin isolated from AFEX treated biomass for value added products
 - a. Proton and carbon NMR
 - b. Molecular weight distribution
 - c. Thermal analysis (Tg and DSC)
3. Lignin and biobased polymers (in collaboration with Prof. Ramani Narayan)
 - a. Compatibility studies on lignin and poly lactic acid blends
 - b. Characterization of lignin for applications in commodity materials

Project coordinator, Maarc Labs

Maarc Labs, Pune, India

March 2006 – August 2007

Project involved standardization, validation and implementation of EPA methods for the analysis of pesticide residues in drinking water and sugar using GC/MS and HPLC. Validation of methods for sugar solutions and sugar syrups.

The work also involved undergoing audits conducted by ISO to maintain the ISO 17025 accreditation. Contract work for chemical, pharmaceutical and food industry. Participated in the joint Pepsi Co. and Coca-Cola venture for the investigation of residual pesticides in plantation white sugar conducted across five sugar mills in Maharashtra, India. The study involved collection and analysis of process intermediates from mixed juice to crystallized sugar.

PROFESSIONAL TRAINING

Attended Training Course on the Maintenance, Principles and practices of 2000 Ion Trap GC/MS system along with MS Workstation Data Handling organized by Varian Ltd. at Yarnton, Oxford, UK. (September 2006)

Attended training program organized by the Department of Agriculture, Government of Maharashtra on Residue Analysis covering various aspects such as Sample preparation, Extraction and cleanup by column chromatography, employment of GC-ECD, GC/MS/MS, LC MS/MS, standard preparation and handling and method validation (May 2006)

Attended training program on Laboratory Competence as per ISO/IEC 17025:2005 organized by Center For Electronics Test Engineering (CETE), Pune and Government of India (September 2005).

FSSAI and Pesticide residue analysis conference organized by Waters in Singapore (September 2014).

In house training by Dr. Kaushik Banerjee and Dr. Dashrath Oulkar (NRCG, Pune) of analytical methods recommended by APEDA (December 2014).

Laboratory Quality Management System & Internal Audit training. Organized by Bureau of Indian Standards (BIS), Mumbai (February 2016).

PUBLICATIONS

1. Papers

Sai S. Keskar, Leslie A. Edye, William O.S. Doherty, John P. Bartley, The chemistry of acid catalysed delignification of sugarcane bagasse in the ionic liquid trihexyl tetradecyl phosphonium chloride, *Journal of Wood Chemistry and Technology*, 2011.

Keskar, Sai S., Edye, Leslie A., Fellows, Christopher M., Doherty, William O. S. ATR-FTIR Measurement of Biomass Components in Phosphonium Ionic Liquids, *Journal of Wood Chemistry and Technology*, 2012.

Five manuscripts in preparation from post doctoral research.

2. Posters

Sai S. Keskar, Leslie A. Edye, William O.S. Doherty, Tributyl methyl phosphonium methyl sulphate for dissolution of hemicelluloses from sugarcane bagasse, 32nd Symposium on Biotechnology for Fuels and Chemicals, Tampa, April 2010.

Sai S. Keskar, Leslie A. Edye, William O.S. Doherty, Mechanism of delignification in trihexyl tetradecyl phosphonium chloride, 31st Symposium on Biotechnology for Fuels and Chemicals, San Francisco, May 2009.

Sai S. Keskar, Leonardo da Costa Sousa, Bruce E. Dale, Towards high throughput lignin measurement in E-AFEXTM treated corn stover, 34th Symposium on Biotechnology for Fuels and Chemicals, New Orleans, May 2012.

3. Oral Presentations

Vasudha S. Keskar, Sai S. Keskar, Pesticide residue analysis of sugar using GC/MS, Sugar Processing Research Institute. Inc (SPRI) conference, Brazil, September 2006.

