

Sindhu Mathai

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Research Interests

- ✧ Development of novel methodologies for organic synthesis
- ✧ Design and construction of natural as well as un-natural compounds of biological importance
- ✧ Synthesis of novel polymers having applications

Teaching Experience

30/07/2019- to date : Assistant Professor, Cochin University of Science and Technology

3/9/2012 – 29/7/2019 : Assistant Professor, Department of Chemistry, Catholicate College, Pathanamthitta

Industrial Experience

05/2008-03/2010: Research Scientist at the Medicinal Chemistry Division of Lupin Limited (Research Park), Pune, India

Project description:

Investigations towards the synthesis and structure-activity studies of anti-diabetic agents

Research experience

01/2008-02/2008: Post-doctoral fellow at the University of Regensburg, Germany under the direction of **Prof. Dr. Oliver Reiser**

Project description:

Investigations towards the total synthesis of Chinensiolide B; a naturally occurring guaianolide

06/2006-11/2007: Alexander von Humboldt Fellow at the University of Regensburg, Germany under the direction of **Prof. Dr. Oliver Reiser**.

Project description:

- (a) Investigations towards the total synthesis of Ixerin and Chinensiolides of guaianolide family.
- (b) Investigations towards the total synthesis of paeolinilide (directed a diploma student)

01/2005-01/2006: Post-doctoral researcher at the University of Florida, USA under the direction of **Prof. Alan R. Katritzky**.

Project description:

- (a) Preparation and characterization of 1,2,3-triazole-cured polymers from end capped azides and alkynes
- (b) Development of benzotriazole methodology for organic synthesis

12/2000-01/2005: Ph. D student at the Organic Chemistry Division of National Institute for Interdisciplinary Science and Technology (NIST) (Formerly Regional Research Laboratory), Trivandrum, India, under the supervision of **Dr. G. Vijay Nair**.

Project description:

- (a) Novel 1,3-dipolar cycloaddition reactions of acyclic carbonyl ylides and related chemistry (Thesis title).
- (b) Development of cerium(IV) ammonium nitrate (CAN) mediated organic synthesis.

Educational qualifications

- 2005** Ph. D in Organic Chemistry
[Cochin University of Science and Technology (CUSAT), Cochin, India (Research work was carried out at the Organic Chemistry Division of National Institute for Interdisciplinary Science and Technology under the supervision of **Dr. G. Vijay Nair**)]
- 1999** Master Degree (M. Sc.) in Chemistry
[Mahatma Gandhi University, Kottayam, India]
- 1997** Bachelor Degree (B. Sc.) in Chemistry
[Mahatma Gandhi University, Kottayam, India]
- 2005** Qualified A1 and A2 levels of Deutsch course (German language) at Goethe-Institute, Munich, Germany

Awards/Recognition

- ✧ Member, P. G. Board of Studies, Mahatma Gandhi University, Kottayam (2017-2020)
- ✧ Alexander von Humboldt Fellowship (2005)
- ✧ CSIR (Council of Scientific and Industrial Research) Senior Research Fellowship, Government of India (2003)

- ✧ Secured place among the top 20% awardees in the merit list of joint CSIR-UGC test in the subject Chemical Sciences (2001)
- ✧ CSIR Junior Research Fellowship, Government of India (2001)
- ✧ UGC-NET, Lectureship (1999)
- ✧ Qualified Graduate Aptitude Test in Engineering (GATE 2000), with percentile score 97.73, conducted by Indian Institute of Technology, Kharagpur, India
- ✧ Received *Rashtrapathi Guide* award (1992)

Publications

1. Susha, D.; Mathai, S. A Study on the properties of various bicyclic alkanes-An Application to graph theory, *Aryabhata Journal of Mathematics and Informatics*, 2017, 9, 670-675.
2. Investigations towards the total synthesis of Chinensiolide B: A naturally Occurring Guaianolide: Proceedings of the National Seminar on Current Trends in Organic and Medicinal Chemistry on January 27, 2016. ISBN: 978-93-5258-618-9.
3. Wang, L.; Song, Y.; Gyanda, R.; Sakhuja, R.; Meher, N. K.; Hanci, S.; Gyanda, K.; Mathai, S.; Sabri, F.; Ciaramitaro, D. A.; Bedford, C. D.; Katritzky, A. R.; Duran, R. S. "Preparation and mechanical properties of cross-linked 1,2,3-triazole-polymers as potential propellant binders" *Journal of Applied Polymer Science*, 2010, 117, 2612-2621.
4. Katritzky, A. R.; Meher, N. K.; Hanci, S.; Gyanda, R.; Tala, S. R.; Mathai, S.; Duran, R. S.; Bernard, S.; Sabri, F.; Singh, S. K.; Doskocz, J.; Ciaramitaro, D. A. "Preparation and characterization of 1,2,3-triazole-cured polymers from endcapped azides and alkynes" *Journal of Polymer Science Part A Polymer Chemistry*, 2008, 46, 238-256.
5. Nair, V.; Mathai, S.; Viji, S.; Mathew, S. "Stereoselective synthesis of highly substituted tetrahydrofuran derivatives via Huisgen 1,3-dipolar cycloaddition of acyclic carbonyl ylides to activated styrenes" *Res. Chem. Intermed.* 2006, 32, 1-7.
6. Nair, V.; Mathai, S.; Mathew, S. C.; Rath, N. P. "A stereoselective synthesis of spiro-dioxolanes via the multicomponent reaction of dicarbomethoxycarbene, aldehydes and 1,2- or 1,4-diones" *Tetrahedron* 2005, 61, 2849-2856.
7. Nair, V.; Mathai, S.; Augustine, A.; Viji, S.; Radhakrishnan, K. V. "The Huisgen reaction of azomethine ylide to isatins: A facile synthesis of spiro-oxindoles" *Synthesis* 2004, 16, 2617-2619.
8. Nair, V.; Nair, S. M.; Mathai, S.; Liebscher, J.; Ziemer, B.; Narsimulu, K. "The Rh(II)-catalyzed reaction of diethyl diazomalonate with thietanes: a facile synthesis of

tetrahydrothiophene derivatives via sulfonium ylides" *Tetrahedron Lett.* 2004, 45, 5759-5762.

9. Nair, V.; Mathai, S.; Varma, R. L. "The three-component reaction of dicarbomethoxycarbene, aldehydes, and β -nitrostyrenes: a stereoselective synthesis of substituted tetrahydrofurans" *J. Org. Chem.* 2004, 69, 1413-1414.
10. Nair, V.; Mathai, S.; Nair, S. M.; Rath, N. P. "A facile three-component reaction of dicarbomethoxycarbene, aldehydes and o-quinones: synthesis of novel spiro-dioxolanes" *Tetrahedron Lett.* 2003, 44, 8407-8409.
11. Nair, V.; Panicker, S. B.; Mathai, S. "Bromination of cyclopropanes using potassium bromide and cerium(IV) ammonium nitrate (CAN): synthesis of 1,3-dibromides" *Res. Chem. Intermed.* 2003, 29, 227-231.
12. Nair, V.; Augustine, A.; Panicker, S. B.; Suja, T. D.; Mathai, S. "Cerium(IV) ammonium nitrate (CAN)-mediated sulfonylation of styrenes: some interesting observations" *Res. Chem. Intermed.* 2003, 29, 213-226.
13. Nair, V.; Panicker, S. B.; Thomas, S.; Santhi, V.; Mathai, S. "Oxidative fragmentation of 1-aryl-1-cycloalkenes using cerium(IV) ammonium nitrate (CAN): some novel observations" *Tetrahedron* 2002, 58, 3229-3234.

Patents

1. Arora, S. K.; Banerjee, R.; Kamboj, R. K.; Loriya, R.; Mathai, S.; Joshi, M.; Suthar, B.; Cheeralavantha, R.; Gote, G.; Bagul, R.; Wetal, R.; Patel, S.; Dixit, R.; Waghchoure, A.; Goel, R.; Sreedhara Swamy, K. H.; "Novel protein tyrosine phosphatase-1B inhibitors" WO2009/109999A1.

Posters/lectures/invited talk presented

1. Served as a Recourse Person in the "National Science Day 2020" celebration sponsored by KSCSTE on 19th February 2020 at Catholicate College, Pathanamthitta
- 2 Served as a Recourse Person in the training programme 'Academic Programme for HSST Chemistry' on 24th November 2016 at Govt. Boys Higher Secondary School, Pathanamthitta.
3. Investigations towards the total synthesis of Chinensiolide B: A naturally Occurring Guaianolide: Mathai, S. Reiser, O.; Proceedings of the *National Seminar on Current Trends in Organic and Medicinal Chemistry*, January 27, 2016

4. Investigations towards the total synthesis of Chinensiolide B; Mathai, S.; Schall, A.; Schanderl, M.; Reiser, O.; 5th Eurasian Meeting on *Heterocyclic Chemistry*, Kuwait city, Kuwait, March 1-6, 2008.
5. Total synthesis of guaianolides; Schall, A.; Kalidindi, S.; Jeong, W-B; Mathai, S.; Laventine, D.; Nosse, B.; Bandicchor, R.; Reiser, O.; *233rd ACS National Meeting*, Chicago, IL, United States, March 25-29, 2007
6. A facile three component reaction of dicarbomethoxy carbene, aldehydes and o-quinones: synthesis of novel spiro dixolanes; Mathai, S.; Nair, V.; *National symposium in chemistry*, Chennai, India, February 2003.
7. Bromination of cyclopropane using potassium bromide and cerium (IV) ammonium nitrate (CAN): synthesis of 1,3-dibromides; Mathai, S.; Panicker, S. B.; Nair, V. *National symposium in chemistry*, Pune, India, January 2002.