

SESHI REDDY SURASANI, Ph.D.

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OBJECTIVE

Seeking challenging assignments in Research & Development in the field of Organic synthesis, Green chemistry, Asymmetric Synthesis, Medicinal Chemistry and bioorganic chemistry.

EXPERIMENTAL SKILL

- Synthetic organic chemist with strong analytical chemistry background.
- Synthesis and characterization of complex organic molecules by using modern methods.
- Functional group inter-conversions in multi-step synthesis.
- Having wide range experience in carrying out moisture and air sensitive reactions.
- Developed green protocols for the synthesis of an array of complex molecules under solvent-free and catalyst-free conditions.
- Production of multi-gram to milligram amounts of target molecules in industrial settings.
- Subject Matter Expert in data interpretation of complex organic molecules using NMR, LC-MS, IR, HPLC, CD, GC and UV.
- Theoretical studies of molecular mechanisms of organic reactions using quantum chemical methods.
- Development of new asymmetric synthetic methodologies for the synthesis of bioactive molecules.
- Antibacterial Activity Studies.

RESEARCH EXPERIENCE

Research Scientist, Ranbaxy Research Laboratories, Gurgaon, INDIA 2012(Sep)-Present

- Presently working in Impurity Profile Group.
- Job Profile includes identification, synthesis/isolation and characterization of known and unknown impurities of Active Pharmaceutical Ingredients (API) by various techniques as LCMS, NMR, Mass and different chromatographic techniques.
- Patent search and relevant data search for new product and impurities.

- Presently working on projects like Dabigatran Etxilate Mesylate, Pazopanib, Linagliptin, Teneligliptin, Vilazodone, Simvastatin, Pravastatin, etc.

Research Associate, Indian Institute of Technology, Roorkee, INDIA (Nov-11_Aug-12)

- Novel Methodologies for the Generation of *o*-Benzoquinone Monoimides. Synthesis of 1,4-Benzoxazine Derivatives.
- Antibacterial activity of benzoxazine derivatives.
- Synthesis of bicyclo[2.2.2]octenones and cyclohexenone derivatives in optically enriched form using Diels-Alder and Michael reactions of masked *o*-benzoquinones in the presence of chiral catalysts.

Graduate Research Assistant, Indian Institute of Technology, Roorkee, INDIA 2007-11

- Diels-Alder reactions of halogenated masked *o*-benzoquinones. Synthesis of halogen-substituted bicyclo[2.2.2]octenones .
- Diels-Alder reactions of masked *o*-benzoquinones under aerobic conditions: Rapid access to densely functionalized bicyclo[2.2.2]octenones.
- Theoretical Studies on the Diels-Alder Reactivity of different Masked *o*-benzoquinones.

Research Assistant, Indian Institute of Technology, Roorkee, INDIA 2006(Aug)-06(Dec)

- Asymmetric Synthesis Using Diphenylprolinol-derived Ligands
- Asymmetric transformations using in situ generated chiral metal complexes from titanium, zirconium and silicon metal alkoxides and α,α -diphenylprolinol-derived ligands.

TEACHING EXPERIENCE

Teaching faculty for 1 year at one of Private Engineering college, A.P. INDIA 2005-06

PROFESSIONAL EXPERIENCE

Presently guiding two master students.

Five Master's projects co-supervised, along with my thesis advisor during my Ph.D.

EDUCATION

Ph.D. Organic Chemistry, Indian Institute of Technology, Roorkee, INDIA 2012

- Mentor: Dr. R. K. Peddinti
- Dissertation: **Generation and reactivity of orthobenzoquinone monoketals**

M.Sc., Organic Chemistry: Andhra University, INDIA
B.Sc., Chemistry: Acharya Nagarjuna University, INDIA

2005
2003

COMPUTATIONAL MODELING SOFTWARE

- GUASSIAN 09 for molecular mechanics and quantum chemical calculations
- Other softwares_ Chemdraw, Chemcraft, Origin and Scifinder, Gauss view.

PUBLICATIONS

1. **S. R. Surasani**, S. K. R. Parumala, R. K. Peddinti “Diels-Alder reactions of 4-halo masked o-benzoquinones. Experimental and theoretical investigations” **Org. Biomol. Chem.** 2014, DOI: 10.1039/C4OB00856A.
2. **S. R. Surasani**, R. K. Peddinti “Diels–Alder reactions of 4-halogenated masked o-benzoquinones with Electron-rich Dienophiles”. **Tetrahedron Letters**, 2011, 52, 4615-4618.
3. **S. R. Surasani**, V.Rajora, N. Bodipati, R. K. Peddinti “Diels-Alder reactions of halogenated masked o-benzoquinones. Synthesis of halogen-substituted bicyclo[2.2.2]octenones”. **Tetrahedron Letters**, 2009, 50, 773-775.
4. **S. R. Surasani**, R. K. Peddinti “Diels-Alder reactions of masked o-benzoquinones under aerobic conditions: Rapid access to densely functionalized bicyclo[2.2.2]octenones” (to be communicated).
5. **S. R. Surasani**, R. K. Peddinti “Theoretical Studies on the Diels-Alder Reactivity of Masked o-benzoquinones” (to be communicated).
6. S. K. R. Parumala, **S. R. Surasani**, R. K. Peddinti “S-Arylation of Thiols with Masked o-Benzoquinones: Synthesis of Diaryl Sulfides” (to be communicated).

PATENTS

1. Singh, P, **S. R. Surasani**, Nayyar, K, Singh, J, Sanwal, S. S, Sathyanarayana, S, Thapr R. K, Prasad, M “Dabigatran Etxelyete Mesylate Impurity: process of it use as reference standard” (FOR U.S.PATENT Filed on 30-Apr-2013).

2. **S. R. Surasani**, Singh, P, Nayyar, K, Nath, A, Prasad, M “Teneligliptin Impurities: process of its use as reference standard” (FOR U.S.PATENT under process).

ORAL PRESENTATIONS

- 239th ACS National Meeting and Exposition scheduled during March 21-25, 2010 at San Francisco CA (USA).
- 4th Uttarakhand State Science Congress Organized by Uttarakhand State Council for Science and Technology, DST, Govt. of India November 10-12, 2009.

POSTER PRESENTATIONS and PARTICIPATION

- Presented poster at 4th conference on “Recent Trends in Instrumental Methods of Analysis” Organized by Indian Institute of Technology Roorkee, DST, Govt. of INDIA 2011
- Presented poster at International Workshop on Chemical Evolution and Origin of Life, DST, Govt. of INDIA 2010
- Participated in International Workshop on Chemical Evolution and Origin of Life, CSIR, Govt. of INDIA 2008
- Participated in National workshop on “Techniques and Challenges for Structure solution in Chemical Crystallography Indian Institute of Technology Roorke 2007
- Participated in “Recent Trends & Advancements in Ultra fast LC & Mass Spectrometry” in Delhi, INDIA 2007

AWARDS and SCHOLARSHIPS

- Fellowship awarded by Council of Scientific & Industrial Research (CSIR), Govt. of India CSIR– S.R.F-Extended in sponsored project 2011
- Fellowship awarded by Council of Scientific & Industrial Research (CSIR), Govt. of India CSIR– S.R.F. 2009
- Fellowship awarded by Council of Scientific & Industrial Research (CSIR), Govt. of India for carrying out research in CSIR–JRF in sponsored project 2006
- Qualified GATE (a national level examination for pursuing Ph.D in Indian premier institutes) with 97 percentile awarded by MHRD 2006
- Best rank in Andhra University M. Sc. Entrance Examination 2003

AFFILIATION

Member of American Chemical Society .

REFERENCES

Dr. R. K. Peddinti, Associate Professor & Associate Dean of Research
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Indian Institute of Technology, Roorkeer-247667, INDIA.
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Dr. R. K. Dutta, Associate Professor, Department of Chemistry,
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Dr. Anuj Sharma, Asst. Professor, Department of Chemistry,
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Tel: +91-1332 284751 (Lab)

PERSONAL PROFILE

Date of Birth: 8th August, 1982
Gender : Male
Marital Status: Married
Nationality : Indian
Languages : English, Telugu, Hindi

SESHI REDDY SURASANI, Ph.D.
RESEARCH SUMMARY (doctoral thesis)

Dissertation title:

Generation and reactivity of orthobenzoquinone monoketals

Halogenated Masked Orthobenzoquinones:

we describe the studies on [4+2] cycloaddition of 4-halo derivatives of 6,6-dimethoxycyclohexa-2,4-dienones. The 4-fluoro, 4-chloro- and 4-iodo- masked *o*-benzoquinones were stable enough for their isolation and characterization. These conjugated dienones cycloadded with several electron-deficient and electron-rich dienophiles in highly regio- and stereo-selective manner to afford the corresponding halo bicyclo[2.2.2]octenone derivatives in high to excellent chemical yields. To evaluate the observed selectivities of these Diels-Alder reactions, we have performed quantum mechanical calculations for the reactions between halo masked *o*-benzoquinones and methyl vinyl ketone and ethyl vinyl ether at B3LYP/6-31G** theory level. These are pivotal synthons in the construction of natural products with diverse structural nature.

Rapid Access to Bicyclo[2.2.2]octenone Derivatives:

Development of highly efficient, environmentally sustainable and promising green protocols for the synthesis of bicyclo[2.2.2]octenone derivatives in excellent chemical yields. We became interested to develop a methodology for the rapid access of bicyclo[2.2.2]octenone derivatives from MOBs with various dienophiles through Diels-Alder reaction. The work has been performed in this direction and the Diels-Alder reactions of labile and readily dimerizing masked *o*-benzoquinones, with electron-deficient dienophiles that resulted in the development of an efficient one-pot method for the preparation of highly functionalized bicyclo[2.2.2]octenones in minutes are described.

Theoretical Studies on the Diels-Alder Reactivity of Masked Orthobenzo-quinones:

The masked *o*-benzoquinones are highly useful synthons in synthetic chemistry for the rapid generation of molecular complexity. Owing to their high reactivity some of these transiently generated molecular entities undergo self-dimerization, prior to the trapping with another reactant. The reactivity of MOBs towards a given dienophile depends on the nature and position of the substituent in Diels-Alder reaction. The considerable difference in the reactivity of these MOBs prompted us to explore both the role of the substituent and substitution pattern in a projected Diels-Alder cycloaddition of the MOBs. A theoretical study of the Diels-Alder reactions of different MOBs with ethylene, MVK and

MVE as dienophiles by using B3LYP/6-31G** theory level. All calculations were performed with the GAUSSIAN 09 suit of programs.

Structure Elucidation:

Elucidation of these synthesized compounds using IR, 1D and 2D ¹H NMR, ¹³C NMR GC, GC-MS, HRMS spectroscopic techniques, succeeded to grow crystals of some of these compounds to confirm their solid state structure using X-ray crystallography.

KEYWORDSDS:

Synthesis of structurally diverse molecules, drug discovery, process chemistry, organometallic chemistry, computational modeling, 6,6-dialkoxycyclohexa-2,4-dienones, Hypervalent iodine reagents, Arene oxidation, Orthoquinone monoketals, 4-Halo masked o-benzoquinones, Cycloaddition reaction, structure activity relationship, purification techniques, methodology development, product development, structurally complex frameworks, small molecule synthesis, bicyclo[2.2.2]octenones, UV, IR, MS, GC, HRMS, NMR and HPLC, CD.