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**Topics in Heterocyclic Chemistry**

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# Topics in Heterocyclic Chemistry

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The series *Topics in Heterocyclic Chemistry* presents critical reviews on "Heterocyclic Compounds" within topic-related volumes dealing with all aspects such as synthesis, reaction mechanisms, structure complexity, properties, reactivity, stability, fundamental and theoretical studies, biology, biomedical studies, pharmacological aspects, applications in material sciences, etc. Metabolism will also be included which will provide information useful in designing pharmacologically active agents. Pathways involving destruction of heterocyclic rings will also be dealt with so that synthesis of specifically functionalized non-heterocyclic molecules can be designed.

The overall scope is to cover topics dealing with most of the areas of current trends in heterocyclic chemistry which will suit to a larger heterocyclic community.

As a rule, contributions are specially commissioned. The editors and publishers will, however, always be pleased to receive suggestions and supplementary information. Papers are accepted for *Topics in Heterocyclic Chemistry* in English.

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### Aims and Scope

The series *Topics in Heterocyclic Chemistry* presents critical reviews on "Heterocyclic Compounds" within topic related volumes dealing with all aspects such as synthesis, reaction mechanisms, structure complexity, properties, reactivity, stability, fundamental and theoretical studies, biology, biomedical studies, pharmacological aspects, applications in material sciences etc. Metabolism is also included which provides information useful in designing pharmacologically active agents. Pathways involving destruction of heterocyclic ring are also dealt with so that synthesis of specifically functionalized non-heterocyclic molecules can be designed.

Overall scope is to cover topics dealing with most of the areas of current trends in heterocyclic chemistry which suits a larger heterocyclic community.

The individual volumes of *Topics in Heterocyclic Chemistry* are thematic. Review articles are generally invited by the volume editors.

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# Preface

The success of the ongoing series “Topics in Heterocyclic Chemistry” being published by Springer Verlag motivated the publisher and the then Chief Editor to bring out two special volumes on “Phosphorus Heterocycles,” and I was invited to shoulder this responsibility in the capacity of the Guest Editor.

The special volume “Phosphorus Heterocycles I” was published last year which included the following critical review articles:

Anellated Azaphospholes

Biological Activity of Aminophosphonic Acids and Their Short Peptides

Phosphinine Derivatives and their Use as Versatile Intermediates in P-Heterocyclic Chemistry

Spiro- and Tricyclic Phosphoranes with Six- and Higher-Membered Rings

The Chemistry of Phosphinines

Synthetic Approaches to 1,2-Heteraphosphacyclanes,

Phosphorus-Containing Calixarenes

From Phosphorus-Containing Macrocycles to Phosphorus-Containing Dendrimers.

After receiving an enthusiastic and active response and support from the academic community, particularly the organophosphorus chemists, we intensified our efforts to bring out the special volume, “Phosphorus Heterocycles II” at the earliest and now it is in your hands.

This volume includes six chapters.

The first chapter “Heterophenes Carrying Phosphorus Functional Groups as Key Structures” presents a detailed description of the recent advances made in this field. The recent studies of all-phosphorus-substituted aromatic compounds have revealed some unique properties of these heterocycles.

The second chapter “Synthesis and Biological Activity of 2,5-Dihydro-1,2-Oxaphosphole-2-Oxide Derivatives” deals with the recent synthetic methods, particularly those using phosphorylated allenes as the starting materials, of these compounds which show interesting biological properties.

The third chapter “Recent Developments in the Chemistry of N-Heterocyclic Phosphines” presents a survey on five- and six-membered phosphorus–nitrogen heterocyclic compounds whose rings combine a phosphazene or phosphazane unit

with an unsaturated  $C_2$  or  $C_3$  building block. It highlights the accomplishments in the exploration of the chemical properties at the border of classical organic heterocyclic chemistry and molecular organic chemistry.

The fourth chapter “Selected Five-Membered Phosphorus Heterocycles Containing a Stereogenic Phosphorus” presents the description of the synthesis and use of these compounds in a few asymmetric syntheses.

The fifth chapter “1-(2,4,6-Trialkylphenyl)-1H-Phospholes with a Flattened P-Pyramid: Synthesis and Reactivity” presents the interesting chemistry of these compounds including electrophilic substitution and Diels–Alder reactions and sigmatropic rearrangements, making a variety of organophosphorus compounds accessible.

The last chapter “Recent Advances in the Chemistry of Diazaphospholes” describes the chemistry of these compounds including their varied and versatile reactivities and different coordination modes in metal complexes.

I take this opportunity to express my sincere thanks to the people at Springer, particularly Ms. Ingrid Samide and Ms. Anette Lindqvist for their dedicated support in completing the project.

Jaipur, Spring 2010

Raj K. Bansal  
Guest Editor

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