

## Tentative Outline

### Special Thematic Issue for Current Organic Chemistry

#### Sustainable synthesis of biomass-based monomers and polymers

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#### **Aims & Scope:**

Environmental concerns about chemical monomers, polymers and composites are strongly increasing indubitably. Most cited topics are related to the difficulties in controlling their end-of-life lifecycle and also the fate of components mixed with them. Hence, the scientific community aims to bring relevant answers to the main critical issues, such as the development of new biobased monomers, polymers and composites. Biobased monomers, polymers and composites are receiving tremendous attention due to the increasing concerns on the depletion of fossil oils and deteriorated environments. On one hand, bio polymers including cellulose, hemicellulose, lignin, chitosan, starch, protein, and natural rubber have been widely used to manufacture novel polymeric materials. On the other hand, monomers from renewable biomass, including vegetable oils, fatty acids, rosin acids, furfural, turpentine, and lactic acid, are molecularly engineered into green polymers. Fundamental and applied research in applying renewable polymer materials as a constituent/constituents, either as reinforcement or matrix component or both, to develop novel composites and nanocomposites with advanced performance and smart functionalities are growing. This Special Issue presents a collection of reviews focused on laboratory- and industrial-scale solutions to the sustainable development of novel and environmentally friendly biomass-based monomers and polymers.

**Keywords:** Sustainable synthesis; Green chemistry; Microwave-assisted modification; Metathesis reaction; Natural product; Biomass-based polymer synthesis

#### **Subtopics along with Contributing authors and abstract**

The subtopics to be covered within this issue are listed below:

1. Conversion/Utilization of Biomass Raw Materials into Chemical Intermediates and Polymers
2. Green Chemistry in Organic Synthesis of Functional Compounds and Polymer materials
3. Metathesis Reaction and Microwave-assisted Modification for Preparing Functional Monomers and Polymers.

4. Polymer Synthesize, Structural Design and Novel Processing of Renewable Polymer Materials
5. Chemical Modification of Renewable Polymer for Enhanced Interfacial, Flame Retardant, Degradation and Plasticizing properties

### **Title no: 1 Recent Progress on Microwave-assisted Modification of Vegetable Oils**

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**Abstract:** Vegetable oils have been widely used in food, surfactants, lubricants, biodiesel, coatings, and other fields due to their advantageous such as renewable, abundant, triglyceride structure suitable for further chemical modification, and potential biodegradable. On the other hand, Microwave technology has received extensive attention from academia and industry in the organic and polymeric chemistry because the technology can greatly shorten the reaction time of synthesis, improve the yield of products, and reduce side reactions. This paper summaries the progress on microwave– assisted modification of vegetable oils and their derivatives, such as the hydrolysis to free fatty acids and glycerol, transesterification to fatty acid methyl esters, and epoxidation to epoxidized compounds or resins.

**Keywords:**Vegetable oils; Microwave-assisted modification; Transesterification; Epoxidation; Hydrolysis

### **Title no: 2 Application of natural polysaccharides as pesticide carriers in agriculture**

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**Abstract:** The development of green pesticide formulations with high efficiency, low toxicity and excellent environmental compatibility has attracted the attention of the world and as the significantly direction of pesticide research. Natural polysaccharides with renewable, nontoxic, biodegradable and biocompatible characters were suitable as carriers for develop intelligent new pesticide formulation, such as hydrogels, microspheres, nanoparticles, nanocomposites and nanoemulsions. Through the embedding of pesticides, the acute contact toxicity and the frequency of application can be reduced. Some polysaccharide carriers exhibit rapid response to stimuli from the external environment, include temperature, light, pH and mechanical force, cause changes of polymers structure, physical and chemical properties to achieve targeted application. This review focuses on the most recent research of polysaccharides as carriers for pesticide controlled release in agriculture.

**Keywords:** Natural polysaccharides, Pesticide, Green formulation, Controlled release

**Title no: 3 The value of natural products turpentine to future pesticide discovery:  
A review**

**Authors names, affiliation and email addresses**

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**Abstract:** Natural products are important resources for the discovery of new pesticides. Turpentine is a volatile oil obtained by distillation of turpentine secreted from pinaceae plants, and it is mainly composed of  $\alpha$ -pinene and  $\beta$ -pinene. Turpentine, as a renewable resource, has attracted widespread attention from both chemists and biologists because of structural particularity and biological diversity. This review mainly discuss the structural characteristics, derivative synthesis, and agriculture biological activities of turpentine, which can provide a foundation for further processing and utilization of turpentine and improving its utilization value.

**Keywords:** Turpentine; pinene; synthesis; agriculture bioactivity

#### **Title no: 4 Research progress of vegetable oil based coalescent**

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**Abstract:** Vegetable oil based coalescent is a kind of nonvolatile coalescent for the reduction of volatile organic compounds (VOCs) in latex paints, which can replace traditional petroleum coalescent. The development and new research progress of coalescent based on vegetable oil are reviewed, the main methods to prepare different coalescent from vegetable oil are introduced. The advantages and drawbacks of the vegetable oil based coalescent are also discussed. The Application and development prospects of coalescent derived vegetable oil are prospected. Those will contribute to the research of vegetable oil based coalescent in the future.

**Keywords:** vegetable oil; modification; coalescent; sustainable development; latex paints

#### **Title no: 5 Metathesis reaction toward main-chain ferrocene-containing polymers: a review**

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**Abstract:** Metallocenes are among the most classical organometallic compounds. Ferrocene, the crown of the metallocene family, is widely studied as a functional unit in electrochemical and catalytic applications due to its sandwich structure. Ferrocene moieties can be embedded into polymer matrix, leading to ferrocene-containing polymers. These polymeric materials combine the unique functionalities of iron center with the processabilities of polymers. Based on the distribution position, the iron centers can be located in the main-chain or side-chains, termed as main-chain ferrocene-containing polymers and side-chain ferrocene-containing polymers, respectively. Metathesis reactions, including cross-metathesis, ring-closing metathesis and ring-opening metathesis, have been well recognized as robust coupling strategies to prepare alkenyl monomers and polymers. In this review, we summarized the the metathesis reaction toward main-chain ferrocene-containing polymers as well as polymerizable ferrocenyl monomers.

**Keywords:** ferrocene, metallocene, metathesis, metallopolymer

**Title no: 6 Recent Progress on Chemical Modification of Phenolic foam**

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China Email: mayufeng@njfu.edu.cn **Abstract:**

Phenolic foam (PF) offers excellent flame retardancy, low smoke and toxicity properties, and is widely applied in aircraft, construction, factory pipeline and transportation. However, the greatest defect of phenolic foam is brittle and friable, and greatly limits its large-scale applications. In order to decline the fragility of PF, the toughening modification of PF is imperative. Long and flexible molecular chains (such as polyurethane prepolymer, epoxy, polyethylene glycol, etc.) or natural resources (such as lignin, soybean oil, cardanol, etc.) were usually introduced into the molecular structure of phenolic resin to reduce fragility by chemical method. In this review, we summarized the most recent research of the chemical modification toward phenolic foams containing polymers as well as polymerizable monomers. which can provide a foundation for further processing and utilization of High performance phenolic foam and improving its utilization value.

**Keywords:** phenolic foam; Chemical Modification; polyurethane prepolymer; lignin; cardanol

**Title no: 7 Self-assembly and Bio-application of AIE Molecules and Nature Polymers**

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**Abstract:**

The fluorescent nanogels self-assembled from aggregation-induced emission (AIE) molecules and nature polymers have attracted increasing attention in recent years due to

the synergic properties arising from both the polymeric hydrogels and AIE characteristics. Especially, the assemblies composed by the nature polymer that have desirable biocompatibility, tunable size and large surface area, and the AIE materials with fascinating fluorescence emission after aggregate assembly are greatly useful in biosensing, diagnosis and therapy disease. The combinations of fluorescent nanogels and bioactive molecules can offer synergetic multifunctional nanomedical platforms, which make it possible to accomplish multimodal imaging and monitoring therapy. This review aims to summarize the recent developments and trends in the self-assembled fluorescent nanogels, investigations of their synthetic methodologies, optical properties, and their prospective applications in bio-imaging, bio-sensing, drug delivery and tissue engineering. We hope that this review will serve as an updated introduction and reference for researchers who are interested in exploring AIE based fluorescent nanogels as biomedical materials for addressing the societal needs at various frontiers.

**Keywords:** Aggregation-induced emission; Self-assembly; imaging; bio-analysis; therapy

#### **Schedule:**

- ✧ Manuscript submission deadline: December 10, 2019.
- ✧ Peer Review Due: January 10, 2020.
- ✧ Revision Due: February 10, 2020
- ✧ Announcement of acceptance by the Guest Editors: February 25th, 2020
- ✧ Final manuscripts due: March 20th, 2020

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