3.4.5 Number of books and chapters in edited volumes published per teacher during the last five years (2019-2023)

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S.No.	Name of Author	Title of Book	Title of Chapter	ISBN	Publisher
01		Extraction of Natural Products	Chapter-8, Extraction of bioactive compounds		Elsevier
		from Agro-industrial Wastes:	from agro-industrial waste		
	·····,	A Green and Sustainable			
	Dr. Nayeem Ahmed	Approach		978-0-12-823349-8	
02		Smart polymer nanocomposites:	Chapter 11, Smart polymer composites in	978-0-12-819961-9	Elsevier
	,	Biomedical and Environmental	bioseparation in Smart Polymer Nanocomposites		
	Dr. Nayeem Ahmed	Applications			
03			Chapter 1, Advances in enzymatic	978-0-323-91154-2	Elsevier
	Dr. Nayeem Ahmed	Enzymes in Oil Processing	interesterification		
04	Prof. Aijaz Ahmad Dar	Value added ingredients and	Self-Assembled Systems based on Surfactants and	978-0-128-16687-1	Elsevier
		enrichments of beverages	Polymers as Stabilizers for Citral in Beverages		
05	Prof. Aijaz Ahmad Dar	Handbook of Nutraceuticals and	Surfactant and Polymer based self-assemblies for	978-1-119-74684-3	Wiley
	''	Natural Products	encapsulation, protection and release of		
			Nutraceuticals		
06	Dr. Masood Ahmad Rizvi	Advances in Chemistry Research	Single Crystal X-Ray Structures and Anticancer	194-0-095-0	Nova
			Activity Studies on Thiazolidine Derivatives		
07	Dr. Masood Ahmad Rizvi	Advances in Chemistry Research	Synthesis, Antioxidant and Antibacterial Properties	194-0-095-0	Nova
			of Thiazolidine-4-Carboxylic Acid Derivatives		
08	Dr. Masood Ahmad Rizvi	Green Chemistry and Chemical	Solubility of Organic Compounds in scCO ₂	978-1-493-99059-7	Springer
	•	Engineering			
09	Dr. Masood Ahmad Rizvi	Recent advances in	Bioorganometallic Chemistry: A new horizon on	978-0-323-90596-1	Elsevier
		Organometallic Chemistry	Organometallic Landscape		
10	Dr. Tariq Ahmad Shah	Transition metal Catalysed C-H	Transition Metal catalysed C-H functionalization	978-1-119-77416-7	Wiley
	*'	functionalization of Heterocycles	of Benzo fused Azoles with two or more		
			Heteroatoms		
11	Dr. Tariq Ahmad Shah	Handbook of C-H	Copper Catalysed SP ³ C-H bond Functionalization	978-352-783424-2	Wiley
		functionalization			



WOODHEAD PUBLISHING SERIES IN COMPOSITES SCIENCE AND ENGINEERING



SMART POLYMER NANOCOMPOSITES BIOMEDICAL AND ENVIRONMENTAL APPLICATIONS



Edited by SHOWKAT AHMAD BHAWANI, ANISH KHAN AND MOHAMMAD JAWAID CHAPTER ELEVEN

Smart polymer composites in bioseparation

Nayeem Ahmed

Department of Chemistry, University of Kashmir, Srinagar, India

11.1 Introduction

Polymer composites which undergo variations in reaction to external stimuli are called intelligent polymers composites, or smart polymers composites (SPCs). The recent applications of SPCs in the field of biotechnology are summarized in this chapter. A number of products have been developed due to progress in biotechnology involving DNA recombinant technology and cell culture techniques. One of the fundamental steps in the development and manufacture of the products is recovery and purification as the final product cost is mostly determined by the separation and purification cost [1]. Therefore, in addition to retaining the biological activity of the product, there is a persistent requirement to acquire swift and economic isolation and purification processes with good product yield. Bioseparation processes demand distinctive approaches from those used in conventional chemical industries [2], i.e., only a few kilograms of a protein produced per year might sell for millions of dollars in the pharmaceutical industry but, in industrial biotechnology, large amounts in tons of bio-based polymers, such as Biopol or Xanthan gum, could be made per year, also yielding millions of dollars in sales but at a considerably lower unit mass price. Entirely new processes for the separation of biological products are often needed to handle unfamiliar material properties (Fig. 11.1). The desired product might be a single component present in low concentration that requires to be separated from bulk water and other soluble components [3].

The bioseparation process involves three steps:

- Separating of the target constituent and impurities
- Separation of the phases
- Recovery of the target component

The use of SPCs in affinity precipitation, where the SPC leads to the establishment of a new phase, is due to their ability to undergo phase separation.

EXTRACTION OF NATURAL PRODUCTS FROM AGRO-INDUSTRIAL WASTES A GREEN AND SUSTAINABLE APPROACH

PDFelement



EDITED BY SHOWKAT AHMAD BHAWANI ANISH KHAN FASIHUDDIN BADRUDDIN AHMAD

Extraction of bioactive compounds from agro-industrial waste

Nayeem Ahmed

DEPARTMENT OF CHEMISTRY, UNIVERSITY OF KASHMIR, SRINAGAR, INDIA

8.1 Introduction

Per year, approximately, 1.3 billion tons of food is wasted globally because of the primary and secondary processes involved in the supply chain mechanism. The wastage involves losses caused during the production and post harvesting processes of the food products. In developing world these processes represent about 75% of food losses and in developed world the wastage at the consumption stage is the primary culprit [1,2]. Specifically, the agri-food industry is accountable for the creation of large volumes of organic waste [biomasses] ending up around 140 billion tons per year [2–4]. Safe disposal and processing of this waste leads to the addition toward the overall cost of the food and also negatively impacts the environment. But if we look at it the other way, then these waste products present us an opportunity to obtain low cost source for energy, biofuel and other value-added chemicals (Figs. 8.1 and 8.2). Therefore, recovery and further processing of these waste materials represents a valuable opportunity [5].

Agricultural wastes comprise of a large variety of residues which include molasses, bagasse, oilseed cakes/ straw, stem, stalk, leaves, husk, shell, peel, lint, seeds, pulp, whole pomace, stubble, which originate from cereals, pulses, legumes, fruits, vegetables, oil seeds, coffee, tea, etc. (Table 8.1). Natural products, because of their wide biological profiles, are considered an attractive value-added motif and specially among them, phenolic compounds are recognized for their benefits to humans in the prevention of cancer and cardiovascular diseases [6–8]. These benefits have been extensively studied and partially attributed to their capability of acting as potent antioxidants and scavengers of reactive oxygen species which are generated under oxidative stress conditions and are therefore responsible for the leading toward several inflammatory and degenerative diseases [9–11]. Therefore, because of these properties, the natural phenolic compounds (Fig. 8.3) have been used as ingredients in food supplements [7,12–15] and additives for functionalization of materials in biomedicine [16–18], cosmetic [19–22], or food industry [23–27].

In this context, it is very important to comply with the principles of the green economy, and achieve the extraction products using environmentally friendly, sustainable and economic



Edited by Showkat Ahmad Bhawani | Anish Khan Awang Ahmad Sallehin Awang Husaini | Mohd Razip Asaruddin

ENZYMES IN OIL PROCESSING

Recent Developments and Applications



CHAPTER 1

Advances in enzymatic interesterification

Nayeem Ahmed

Department of Chemistry, University of Kashmir, Srinagar, Jammu and Kashmir, India

1.1 Introduction

Even though enzymes have a long history in the food industry, bulk fat modification using them at a reasonable cost is a relatively recent development. Enzymes are often employed in the food industry to hydrolyze substrates into simpler molecules, such as glucose from starch, glucose and galactose from lactose, and pectic acid from high-molecular-weight pectins [1]. It was formerly believed that enzyme proteins could not function in the absence of water or in organic solvents. However, these are all aqueous processes. Dry enzyme powder products, however, were found to be both active and stable in nonaqueous environments under particular circumstances [2]. These and other studies provided evidence that lipids may be modified by lipase enzymes. The early 1980s saw the start of lipase application research at Unilever and Novozymes. Several other companies, most notably Fuji Oil, were also active. The application that attracted the most attention was the creation of a cocoa butter equivalent (CBE) exploiting the sn-1.3 specificity of some fungal lipases. To create a CBE-like product with increased amounts of the targeted triglycerides, 1 (3)-palmitoyl-3(1)-stearoyl-2-monooleine (POSt) and 1,3-distearoyl-2monooleine, Macrae [3] describes employing a lipase product absorbed into a kieselguhr matrix (StOSt).

Making an enzyme slurry with kieselguhr and precipitating the enzyme onto the inorganic particulate material with a solvent like acetone or an alcohol (ethanol or methanol) produced the immobilized lipase. The immobilized enzyme was then filtered out, dried, and stored until needed. These catalysts needed to be revived with 10% water to achieve high enzyme activity, and stearic acid needed to be added to the petro-leum ether (PE)-dissolved enzyme if it was to be used. Another problem was that the water originally provided to the enzyme would eventually be

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THE SCIENCE OF BEVERAGES VOLUME 14



VALUE-ADDED INGREDIENTS AND ENRICHMENTS OF BEVERAGES

Edited by Alexandru Mihai Grumezescu Alina Maria Holban



SELF-ASSEMBLED SYSTEMS BASED ON SURFACTANTS AND POLYMERS AS STABILIZERS FOR CITRAL IN BEVERAGES

Oyais Ahmad Chat^{*,†}, Parvaiz Ahmad Bhat^{*,†}, Nighat Nazir[‡], Aijaz Ahmad Dar^{*}

^{*}Physical Chemistry Division, Department of Chemistry, University of Kashmir, Srinagar, Jammu and Kashmir, India, [†]Department of Chemistry, Government Degree College, Pulwama, Jammu and Kashmir, India, [‡]Department of Chemistry, Islamia College of Science and Commerce, Srinagar, Jammu and Kashmir, India

15.1 Introduction

Citral is widely used as an additionally added active flavoring ingredient for enrichment of foods (Choi et al., 2009b) and beverages (Piorkowski and Mcclements, 2014), well known for its pleasant, strong, lemon-like aroma (Berk, 2016). The European Commission (2002/113/ EC, 2002; 2004/1935/EC, 2004; 89/107/EEC, 1989) has accepted the use of citral, linalool, limonene, etc. as flavorings in beverages/food products, and have also been generally recognized as safe (GRAS) by the US Food and Drug Administration (FDA). Chemically citral is an acyclic monoterpene aldehyde (3,7-dimethyl-2,6-octadienal), comprising of two geometrical isomers, the more stable citral-a (α -citral, geranial, Eisomer, (E)-3,7-dimethyl-2,6-octadienal) and citral-b (β -citral, neral, Z-isomer, (Z)-3,7-dimethyl-2,6-octadienal) are in the proportion of 75% and 25%, respectively (Schieberle and Grosch, 1988). The name citral has been derived from Backhousia citriodora F. Muell, being its original source (Southwell et al., 2000). Citral is mainly obtained from Litsea cubeba oil and lemon grass oil (Cymbopogon) (Berger, 2007; Pihlasalo et al., 2007; Maswal and Dar, 2014; Skaria et al., 2012). Citral is also obtained from isoprenol (obtained by addition of formaldehyde to isobutylene), isoprene (from petrochemicals), pyrolysis of limonene (from sulfate turpentine), and from pinenes (from turpentine) (Berger, 2007). Citral has a wide range of medicinal and therapeutic uses; as

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16 Surfactant and Polymer-Based Self-Assemblies for Encapsulation, Protection, and Release of Nutraceuticals

Saima Afzal¹, Mohd Sajid Lone¹, Pawandeep Kaur¹, Firdous Ahmad Ahanger¹, Nighat Nazir², and Aijaz Ahmad Dar¹

¹ Soft Matter Research Group, Department of Chemistry, University of Kashmir, Srinagar, Jammu and Kashmir, India

² Department of Chemistry, Islamia College of Science and Commerce, Hawal, Jammu and Kashmir, India

16.1 Introduction

Customer satisfaction regarding the effect of the general well-being of food products on human health has been gaining increasing importance due to the advent of more food processing techniques. In contemporary times, it is possible to fabricate palatable foods by employing different bioengineering methods through various encapsulation methods and carriers, which has opened up a huge food service industry across the globe. Owing to the rapid advancements in the nanoscopic imaging and other related physicochemical characterization techniques, the revelations about the very captivating microstructure of the food has been on the rise (Livney 2015). This has greatly enhanced our abilities to understand and manipulate the food microstructure for obtaining better food properties and functionalities. The elaborate relation between food and health has been the driving force behind the rapid and inclusive increase in scientific literature to alleviate the occurrence of diseases like obesity, cancer, and diabetes. The term "nutraceutical" is a link between food and medicine derived from the combination of terms "nutrition" and "pharmaceutics." The famous quote by Hippocrates (400 BC), "Let food be thy medicine and medicine be thy food" sums up the entire significance of nutraceuticals and underscores their importance and familiarity among the masses since time immemorial (Helal et al. 2019). Pertinently, in the recent past the nutraceutical industry has picked up pace so fast that its estimated market is expected to reach about 49 billion USD in 2023 (Chen and Hu 2020). Nutraceuticals are not essential for life, but they have a significant effect on the human health depending on their amount and type present within a living body. A significant body of literature points toward the fact that nutraceuticals enhance the human resistance to the diseases and hence promote good health (Asghar et al. 2018). Owing to their beneficial effects, they have been used as treatments against different health ailments, like cancer, inflammation, atherosclerosis, obesity, and diabetes in addition to having antiaging and antioxidant properties (Table 16.1). (Bourbon et al. 2018; Zhang et al. 2019)

The nutraceuticals are quite often the bioactive molecules or molecules derived from plant sources. Such molecules suffer from lots of challenges that have been on the forefront confronting scientists for harvesting their health benefits like the low aqueous solubility, chemical instabilities (due to the changes in pH, ionic strength, etc. along the gut), and their targeted delivery (Chen and Hu 2020). The developments in the food nanotechnology hold a promising future in order to provide with the new and effective strategies in combating such challenges related to the bioavailability and stability of the nutraceuticals.

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Transition-Metal-Catalyzed C-H Functionalization of Heterocycles

TM Catalyst

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Transition-Metal-Catalyzed C-H Functionalization of Heterocycles

Chapter 7

Transition Metal-Catalyzed C–H Functionalization of Benzofused Azoles with Two or More Heteroatoms

Tanumay Sarkar, Subhradeep Kar, Prabhat Kumar Maharana, Tariq. A. Shah, Tharmalingam Punniyamurthy

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📌 PDF

Abstract

The regioselective functionalization of benzo-fused azoles demands an extensive derivatization owing to their presence in a plethora of pharmacophores, natural products, and organic materials. Although primitive methods such as metalation, cyclocondensation, and cross-coupling reactions have served to build these scaffolds, the drawbacks associated with them have rendered the functionalization difficult. Transition metal-catalyzed C–H bond functionalization has emerged as one of the reliable sustainable strategies to tailor these

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Abstract			Copper-catalyzed/mediated aromatic			
Transition metal-catalyzed C—H functionalization	C—H bond functionalization Ming Zhang Applied Organometallic Chemistry					
transformation of simple substrates into complex molecules with structural diversity. Despite the indispensable advances of C—H functionalization developed to date, most of the methodologies demanded the use of expensive 4d and 5d transition metals. On the						

other hand, because of the low toxicity, less expensive, and one of the most abundant 3d row metals, copper progressively possesses a promising metal for the development of

C—H functionalization. Herein, we present the diverse array of copper-based expedient

C(sp³)—H functionalization for the construction of directed and nondirected C—C, C—N,

C—O, C—S, and C—halogen bonds.

Copper-Catalyzed Site-Selective Intramolecular Amidation of Unactivated C(sp³)—H Bonds

Xuesong Wu, Yan Zhao, Guangwu Zhang,

Chapter 9. Synthesis, 🗈 Antioxidant and Antibacterial Properties of Thiazolidine-4-Carboxylic Acid Derivatives

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Rohidas M. Jagtap¹, Sachin S. Sakate¹, Satish K. Pardeshi² and Masood A. Rizvi³ ¹Department of Chemistry, P. E. S. Modern College of Arts, Science and Commerce, Shivajinagar (Autonomous), Pune, MS, India ²Department of Chemistry, Savitribai Phule Pune University (Formerly University of Pune), Ganeshkhind, Pune, MS, India ³Department of Chemistry, University of Kashmir, Hazratbal, Srinagar, Jammu and Kashmir, India

Part of the book: Advances in Chemistry Resea Volume 76



Green Sustainable Process for Chemical and Environmental Engineering and Science Supercritical Carbon Dioxide as Green Solvent

2020, Pages 379-411

Chapter 16 - Solubility of organic compounds in scCO₂

<u>Noor U Din Reshi</u>^a, Masood Ahmad Rizvi^a, <u>Syed Kazim Moosvi^b, Mudasir Ahmad ^c, Adil Gani^c</u>

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Abstract

The growing environment, health, and economic concerns about using organic solvents have led to efforts for the search of unconventional solvents. Water, ionic liquids (ILs), and supercritical fluids (SCFs) are driving attention for their use as alternative solvents. SCFs are desirable as they combine the properties of both liquid and gaseous state. Their liquid state Chapter 4. Single Crystal X-Ray Structures and Anticancer Activity Studies on Thiazolidine Derivatives



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Rohidas M. Jagtap¹, Sachin S. Sakate¹, Satish K. Pardeshi² and Masood A. Rizvi³ ¹Department of Chemistry, P. E. S. Modern College of Arts, Science and Commerce (Autonomous), Shivajinagar, Pune, MS, India ²Department of Chemistry, Savitribai Phule Pune University (Formerly University of Pune), Ganeshkhind, Pune, MS, India ³Department of Chemistry, University of Kashmir, Hazratbal, Srinagar, Jammu and Kashmir, India

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Chapter 10

Bioorganometallic chemistry: a new horizon on organometallic landscape

Mudasir Ahmad Hafiz, Moniza Qayoom, Tabee Jan, Mohd Mustafa, Tabasum Maqbool and Masood Ahmad Rizvi

Department of Chemistry, University of Kashmir, Hazratbal, Jammu and Kashmir, India

10.1 Introduction

The development of newer chemical systems open doors to explore the influence of novel chemical moieties in biological turf. While organic compounds mostly form the framework, inorganic constituents serve as functional components of the biosystems. Organometallics, which represent the ensemble of organic and metal components, have been restricted in biosystems except for coenzyme-B12. The life systems have not used organometallic compounds so often most probably due to the reactivity of metal—carbon bond toward aqueous aerobic conditions prevalent with biological systems; wherein metal—carbon bond undergoes hydrolysis with water and oxidation with molecular oxygen. In spite of these inherent drawbacks, a careful design of organometallic systems with relatively stabler metal—carbon bonds which survive biological conditions can bring remarkable advances, set newer medical regimes and address the unsettled challenges of therapeutics.

In its broader sense, "bioorganometallic chemistry" (BOC) refers to the chemistry of biomolecules with biologically active substances that have at least one carbon directly bound to a metal [1]. The field of BOC essentially involves the design and development of organometallic systems that are synchronous with the biological interface and selective for specific therapeutic goals [2]. BOC introduces a new domain in chemotherapeutics that aims to extend designed organometallic chemistry to bioanalytics and chemotherapeutics. In BOC, the function of the organometallic fragment can be multifaceted and frequently depends on the particular organometallic system. Generally speaking, pioneering organometallic species found in human beings included B_{12} coenzymes with a cobalt-carbon bond system

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