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Preface

Greetings to all of honorary Indonesian Journal of Applied Chemistry (J. Kim. Terap. Indones.) readers!

Deepest gratitude from all of us should be conveyed sincerely to Allah The Highest and Most Merciful whom allowed and blessed the publishing of Indonesian Journal of Applied Chemistry (J. Kim. Terap. Indones.) Volume 21 No.2 April 2020. Whom also allowed and blessed this journal to reach all of readers hands, through a systemic supervision by our respectful reviewers.

Indonesian Journal of Applied Chemistry (J. Kim. Terap. Indones.) is a product of our continuous improvements from the originally called Jurnal Kimia Terapan Indonesia (JKTI). In a way to transform into International Journal, several quality improvements had been conducted including (i) all articles were written in English, (ii) close involvement of International reviewers, (iii) adopting Open Access Journal System in submitting, reviewing and publishing articles, (iv) using compact article template and (v) having a registered e-ISSN to accommodate reaccreditation and global indexing process.

In this edition, several astonishing articles from well-known Indonesian Institutions were served. They are: (i) Synthesis of Nanofiber from Poly Vinyl Alcohol (PVA)-Collagen using Electrospinning Methods, (ii) Enrichment of Omega-3 from Anchovy (Stolephorus sp.) Fish Oil by Enzymatic Hydrolysis, (iii) Tapioca Waste-Methyl Methacrylate Irradiation for Biodegradable Plastic Raw Materials, (iv) Effect of Tackifier Addition on Cushion Compound Formulation for Tire Retreading Application, (v) Effect of Liquid Media Composition on $\alpha$-Glucosidase Inhibitory Activity from Aspergillus elegans SweF9.

By this letter, editors would be honored to express our gratitude and appreciation to all reviewers for all of their hard work and kind cooperation in reviewing and improving the quality of articles in this journal. And for sure, to all authors in this journal, your trust and willingness in publishing your articles in this journal are highly appreciated.

As the closing remarks, editors always invite all researcher to publish their articles in Indonesian Journal of Chemistry (J. Kim. Terap. Indones.) in order to spread out their findings and knowledge in applied chemistry related field. To be heard and known by all researcher around the world in the same field. Article manuscripts can be submitted from our official website http://kimia.lipi.go.id/inajac/index.php

Your critics and suggestions were very welcome in the way to support our continuous improvement efforts. Our biggest wish is this journal will convey benefits to all honored readers and contribute to chemistry knowledge. Have a good read!

Serpong, 30 April 2020

Editor in Chief
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## ABSTRACT

Synthesis of Nanofiber from Poly Vinyl Alcohol (PVA)-Collagen using Electrospinning Methods

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**Abstract**

Polyvinyl alcohol (PVA) polymer can be used as matrix to be mixed with collagen in the substance of primary wound dressing material to cover wound that prevents growth of bacteria and enhanced tissue formation. Collagen fiber is fragile, so important to combined with PVA to obtain better mechanical properties. The solution of 10 wt% aqueous PVA solution was made by dissolving 2 gram of PVA powder into 20 mL of deminerallized water under 80-90°C. While a solution of 1 wt% of collagen was made by dissolving 0.5 gam of collagen powder into 10 mL of demineralized water which contained 0.5 M of acetic acid. After that, it stirred using magnetic stirrer through homogenously for 2 hours. The same way was conducted to make a solution of 2 wt% of collagen. Then, they, a solution of both 1 wt% and 2 wt% of collagen, dissolved in a solution of 10 wt% of aqueous PVA solution. PVA-Collagen fibers produced using electrospinning method with different direct current power supply voltage such as 15 kV, 19 kV and 23 kV sequentially. Analysis of functional groups show that the presence of identical compounds produced and new functional groups are not formed. SEM data show that the effect of variation of voltage and collagen concentration on the resulting morphology of fiber. PVA-collagen 2% fibers produce continuous fibers, has a diameter 284-426 nm, thickness 0.0324-0.0483 mm and has a high percent of elongation so it can be used as a wound dressing material.

**Keywords:**

electrospinning, collagen, polyvinyl alcohol

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## Enrichment of Omega-3 from Anchovy (Stolephorus sp.) Fish Oil by Enzymatic Hydrolysis

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### Abstract

Anchovy (Stolephorus sp.) is an economically important fish in Indonesia. Anchovy contains Omega-3 that important to maintain the health of the heart and brain. This study aimed to enrich the Omega-3 content of anchovy oil from the North Sea of West Java. The extraction of anchovy oil was carried out by the soxhlet method. Enrichment of omega-3 from anchovy fish oil is carried out by hydrolysis with a commercial lipase enzyme at concentration 500, 1000, 1500, and 2000 unit/600g fish oil, for 5, 10, 15 and 20 hours. Before hydrolysis, fish oil was added with solvent water, ethanol, toluene, and n-hexane. Omega-3 content of fish oil products were analyzed by using Gas Chromatography (GC) with FID detector with retention time 14.068 min and 15.506 min for α-Linolenat (ALA) and eicosapentaenoic (EPA), respectively. The results showed the highest omega-3 content (ALA 0.54% and EPA 1.103% ) was produced by addition n-hexane with a ratio 1:6 with the concentration of lipase was 1000 units for 20 hours.

### Keywords:

Anchovy oil, Enzymatic reaction, Lipase enzyme, Omega-3

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Tapioca Waste-Methyl Methacrylate Irradiation for Biodegradable Plastic Raw Materials

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Abstract

Nuclear technology can be applied not only as energy (electricity) but also in industry as an initiator on polymer reaction. The polymer reaction can combine two monomers, as an example, tapioca waste and methyl methacrylate, to make biodegradable plastics. Tapioca waste is used due to its biodegradability properties. Tapioca waste gel is formed by adding an equal aqua dest ratio to waste weight. After gel formed, several concentrations of methyl methacrylate (w/w) is added to the gel then packed into ampules. Using the Co-60 gamma irradiation source, the gel is irradiated at 5 kGy absorbed dose. Glycerol as a plasticizer is added to the gel to increase polymer flexibility. To analyze its mechanical properties, firstly, we need to mold the samples using a pressurized-hot press machine. Then added methyl methacrylate at varying doses. The specimen is tested by analyzing tensile strength characteristics (ASTM D638-14). Fabrication of biodegradable plastic-based packaging by using starch has an increase in the mechanical and thermal properties.

Keywords: Irradiation, polymer, tapioca waste, methyl methacrylate, biodegradable plastic

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Effect of Tackifier Addition on Cushion Compound Formulation for Tire Retreading Application

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Abstract

Tire retreading is a prospective industry. Old tires are repaired and retreaded with suitable tread compounds to fulfill the requirement as the new ones. One of the important components in tire retreading process is cushion compound. Cushion compound consists of unsaturated rubber, in this case natural rubber Hevea brasiliensis was used, less phr of filler compared to the retread compound, and additives such as peptizer, tackifier, processing oil, antioxidant, activator, accelerator and curatives. Tackifier is an important component in cushion compound since its role to make a bonding between different layer, the initial tire after buffing and new retread layer. Tackifier should has good resistance, good compatibility and does not affect the rheological and dynamical properties of bonded rubber. The general tackifier that used in industries are hexamethyl tetramine as methylene donor and resorcinol as methylene acceptor. There is certain reaction between those two additives that determine how good the performance of cushion compound and its effect to retreading process. To obtain optimum reaction, comparison between resorcinol and hexamethyl tetramine were varied as 1:1 (FRR1), 1:2 (FRR2) and 1:3 (FRR3). Hardness test, compression test, rebound resilience, tensile and tear strength, and FTIR were done to observe the optimum variation for retread application. Compared to the control with no tackifier at all, FRR2 showed the optimum result with 21.75 MPa (min. 19 Mpa) and 454,54% elongation at break (min. 450%).

Keywords: Irradiation, polymer, tapioca waste, methyl methacrylate, biodegradable plastic

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Effect of Liquid Media Composition on α-Glucosidase Inhibitory Activity from Aspergillus elegans SweF9

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Abstract

The aim of this study is to determine the effect of liquid media composition on the inhibitory activity of α-glucosidase from endophytic fungus Aspergillus elegans SweF9 isolated from seaweed (Macroalgae euchema). Fermentation was carried out in three types of liquid media, namely: potato dextrose broth (PDB), potato malt peptone (PMP), and Czapek-dox broth (CDB), which was incubated for 10 days at room temperature with static conditions. Ethyl acetate were used to extract active metabolites from fungal biomass and filtrate from each media. Antidiabetic activity was measured based on inhibition of enzyme α-glucosidase. The results showed that filtrate extract of A. elegans SweF9 which was cultured on the media PDB showed the highest inhibitor activity to the α-glucosidase enzyme with an IC50 value of 1.74 µg / mL. Based on these results, the PDB media is an appropriate medium for culturing A. elegans SweF9 to produce secondary metabolites that can be used as a new source of antidiabetic agents.

Keywords:
α-glucosidase inhibitor, Aspergillus elegans SweF9, endophytic fungus

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