

## PREFACE

Indonesian Polymer Journal (Majalah Polimer Indonesia, MPI, ISSN 1410-7864) is a national journal published and imprinted by the Indonesian Polymer Association (Perhimpunan Polimer Indonesia, HPI). MPI is a peer-reviewed journal in Polymer research. It publishes original research in all areas of polymer science and technology, including synthesis and polymer reaction, polymer process and composite, polymer characterization, functional polymer and development, and polymer for energy and environment. Since 1998, MPI published in Bahasa Indonesia. Starting from 2016, MPI provides publishing both articles in English and Bahasa Indonesia. We publish two editions every year. Thank you for the exceptional contribution to all respectful authors, peer-reviewers, and editors.

This issue (Ind. Poly. Jour., Volume 22, Issue 1, Year 2019) has published 4 articles from SNP XII 2018 event (in Bahasa Indonesia) and 1 original article (in English). This issue was authored and co-authored by 17 authors from Indonesia. This issue has available online since May 2019 for the regular issue of June 2019.

In this issue, there are two articles focuses on hydrogel i.e. production of polyethylene glycol-chitosan based hydrogel using electron beam irradiation by *Nurlidar et al.* and modification of hydrogel with addition of honey: characteristics of physical-chemical properties of hydrogel studied by *Haryanto et al.* On the polyethylene glycol-chitosan based hydrogel article, *Nurlidar et al.* reported that the FTIR spectra of the hydrogels showed the presence of specific functional groups that are correlated to PEG and chitosan, indicating the formation of 3D network between PEG and chitosan. The hydrogel of PEG-chitosan 10 kGy showed a high swelling ratio of up to 6.7 times its initial weight. This hydrogel showed the potential to be applied as a 3D scaffolds in drug delivery system. On the hydrogel with addition of honey article, *Haryanto et al.* reported that with the addition of honey, the elongation percentage of the hydrogels increases, while the gel fraction and tensile strength of the hydrogels decrease. The highest swelling ratio (614%) and water vapor transmission rate (46 g/m<sup>2</sup> hour) were obtained at 2% honey concentration. Furthermore, the addition of honey could also increase the water vapor transmission rate and flexibility, but decrease the tensile strength of the hydrogels formed.

Another article focused on Starch-Graft-Acrylic Acid/Bentonite (St-g-AA/B) composite gel: synthesis, characterization and absorption capacity by *Laksanawati et al.* They reported that the graft copolymerization process uses potassium persulfate (KPS) as a free radical initiator and N'-N-Methylenebisacrylamide (MBA) solution as a crosslinker. MBA is dissolved first to avoid agglomeration and to quickly spread in the mixture when the reaction takes place. The addition of bentonite at the beginning of the reaction process is more evenly distributed on the polymer network. The synthesis process at 70°C for two hours with purging nitrogen gas. The product is dried until constant weight. Based on the result, show that composite gel had an optimum MBA value of 1.5%wt and bentonite concentration 2%wt acrylic acid with water absorbency obtained were 202.67 g g<sup>-1</sup> and 153 mL mL<sup>-1</sup>. The product was characterized by Fourier Transform Infrared Spectroscopy (FTIR) and X-ray Diffraction (XRD). From the results

of the characterization, it was found that the composite gel St-g-AA/B was successfully synthesized by the absence of C double bonds on acrylic acid and reduced starch crystallinity.

There is also article focused on effects of gamma irradiation on changes in function groups, water absorption and sterility of chitosan/collagen scaffold by *Lukitowati et al.* On their study, they aimed to obtain chitosan/collagen scaffolds which are sterilized with gamma rays at sterile doses (15 and 25 kGy), and analyze the effect of gamma-ray irradiation doses on their functional groups, water absorption and sterility. Chitosan/collagen scaffolds (50-50% v/v) were prepared using the freeze-drying method and irradiated by gamma-rays (doses of 0, 15, and 25 kGy). Changes of functional groups were tested using Fourier Transform Infra Red (FTIR), water absorption using digital analytic scales, and scaffolds sterility with media fluid thioglycollate. The results of measurements of water absorption were analyzed statistically by Tukey's posthoc confidence level of 0.05. Chitosan/collagen scaffolds show decreased intensity in hydroxyl and amide groups after gamma-ray irradiation. The dose of irradiation given does not give a significant effect on water absorption. Sterile scaffold results were given by scaffold irradiated at 15 and 25 kGy. Irradiated chitosan/collagen scaffolds can be considered as a promising biomaterial.

The last article on this issue focused on hydrophilic domain contribution on the proton transport properties of sulfonated polysulfone based blend membranes by *Piluharto et al.* They reported that the introduction of PSF into SPSF to form a blend membrane is observed to activate the function of fixed charged groups inside the membrane, thus facilitate transport of ions. The presence of Ba<sup>2+</sup> ions as ionic cross-link bridges improves the membrane transport properties, especially the proton conductivity and its function as an ionic barrier. Moreover, Ba<sup>2+</sup> ions also make the membrane becomes more hydrophilic as deduced from their contact angle and water uptake. However, the information concerning phase segregation and hydrophilic clusters formation has to be verified and studied further.

Currently, Indonesian Polymer Journal is an open access national journal. Readers can read and download any full-text articles for free of charge. Official website address of Indonesian Polymer Journal is: <http://hpi-polimer.org/mpi>. The Editor would like to appreciate and to call for papers all researchers, academicians, industrial practitioners focused on all areas of polymer science and technology to contribute to this journal.

Editor-in-Chief

**Veinardi Suendo**

## TABLE OF CONTENTS

PREFACE.....	i
TABLE OF CONTENTS .....	iii
LIST OF ABSTRACT .....	iv
<b>Gel Komposit <i>Starch-Graft-Acrylic Acid/Bentonite (St-g-AA/B)</i>: Sintesis, Karakterisasi dan Kapasitas Penyerapan</b>	
<i>Trias Ayu Laksanawati, Prida Novarita Trisanti, Sumarno.....</i>	1
<b>Pengaruh Iradiasi Gamma terhadap Perubahan Gugus Fungsi, Daya Serap Air dan Sterilitas <i>Scaffold</i> Kitosan/Kolagen</b>	
<i>Fajar Lukitowati, Rimma Patricia, Noor Anis Kundari.....</i>	5
<b>Pembuatan Hidrogel Berbahan Dasar Polietilena Glikol-Kitosan menggunakan Iradiasi Berkas Elektron</b>	
<i>Farah Nurlidar, Arif Rachmanto, Darmawan Darwis.....</i>	10
<b><i>Hydrophilic Domain Contribution on the Proton Transport Properties of Sulfonated Polysulfone Based Blend Membranes</i></b>	
<i>Bambang Piluharto, Yuyus Jayusman, Veinardi Suendo, Sadjah Achmad, Cynthia Linaya Radiman ...</i>	14
<b>Modifikasi Hidrogel dengan Penambahan Madu: Karakteristik Sifat Fisika-Kimia Hidrogel</b>	
<i>Haryanto, Karnofa, Angga Yuli Setiyawan.....</i>	19
KEYWORD INDEX.....	24
AUTHOR INDEX.....	25