View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by University of Surabaya Institutional Repository

# PROCEEDING BOOK

# The 3rd International Conference on Pharmaceutical Nanotechnology/Nanomedicine (ICPNN)

## The application of nanobiology to the cancer treatment

Santika Hotel Depok

9 November 2017

Organized by :

Faculty of Pharmacy, University of Pancasila

&

Ikatan Apoteker Indonesia, Cabang Jakarta Selatan

# PROCEEDING

## The 3rd International Conference on Pharmaceutical Nanotechnology/Nanomedicine (ICPNN)

**Theme:**

## The Application of Nanobiology to the Cancer Treatment

Depok, November 9th, 2017

**Speakers:**
Jai Prakash, PhD (University of Twente, Netherlands)
Subbu Venkatraman (Nanyang Technological University, Singapore)
Mohd Zobir Hussein (Universiti Putra Malaysia)
Yashwant Pathak (University of South Florida, USA)
Edy Meiyanto (Gadjah Mada University, Indonesia)
Deni Rahmat (University of Pancasila, Indonesia)

**Fakultas Farmasi Universitas Pancasila**

**PROCEEDING**

# The 3rd International Conference on Pharmaceutical Nanotechnology/Nanomedicine (ICPNN)

**Theme:**

## The Application of Nanobiology to the Cancer Treatment

**Steering Committee:**
Prof. Dr. rer. nat. Wahono Sumaryono, Apt.
Prof. Dr. Shirly Kumala, M.Biomed., Apt.

**Organizing Committee:**
Dr. rer.nat. Deni Rahmat, M.Si., Apt.
Dra. Titiek Martati, M.Si., Apt.
Sarah Zaidan, S.Si, M.Farm, Apt
Lusiana Ariani, S. Farm, M.Farm, Apt
Nur Miftahurrohmah, M.Si., Apt
Dr. Yati Sumiyati, M.Kes, Apt
Rika Sari Dewi, S.Farm,Apt
Dra. Diana Serlahwaty, M.Si, Apt
Dra. Risma Marisi Tambunan, M.Si, Apt
Dra. Erlindha Gangga, M.Si, Apt

**Editor:**
Anarisa Budiati, S.Farm, M.Farm, Apt
Atut Ruswita Handayani, S.Farm., Apt

**Reviewer:**
Prof. Dr. rer. nat. Wahono Sumaryono, Apt.
Prof. Dr. Shirly Kumala, M.Biomed., Apt.
Dr. rer.nat. Deni Rahmat, M.Si., Apt.
Prof. Dr. Syamsudin, M.Biomed., Apt.

Published by
Fakultas Farmasi Universitas Pancasila
Jl. Srengseng Sawah, Jagakarsa, Jakarta 12640
Telp. 021-7864727/8
E-mail: farmasi@univpancasila.ac.id
Website: http://www.univpancasila.ac.id/

ISBN 978-602-72418-5-5

All Right Reserved
No Part of This Publication May Be Reproduce Without Written Permission of The Publisher

*International Conference on Pharmaceutical Nanotechnology/Nanomedicine,*
*Depok, 9 November 2017*
*Faculty of Pharmacy, University of Pancasila*
*ISBN: 978-602-72418-5-5*

# Opening Remarks

Ladies and Gentlemen, it is my pleasure to welcome you all to the "The 3rd International Conference on Pharmaceutical Nanotechnology/ Nanomedicine (ICPNN) 2017". Every year we regularly held this conference with different focus topics. This year we will explore more in the utilization of nanotechnology in cancer treatments.

As we know that cancer is one of Sthe most serious fatal diseases in today's world that kills millions of people every year. It is also one of the major health concerns which does not have any boundary and can affect any organ of people from any place. The main challenge of cancer therapeutics is to differentiate the cancerous cells and the normal body cells. Nanotechnology has provided the opportunity to get direct access of the cancerous cells selectively with increased drug localization and cellular uptake. Nanomedicine is simply the application of nanotechnologies in a healthcare setting and the majority of benefits that have already been seen involve the use of nanoparticles to improve the behaviour of drug substances.

This conference offers unique opportunities to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results related to Nanotechnology and Nanomedicine. It also provides a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations and trends in other fields such as microbiology, biotechnology, natural products, and other miscellaneous topics in pharmaceutical sciences.

I hope this conference will bring benefits to all of our participants and also strengthen the relationships that have been built. I want to express my sincere thanks to everyone that have been involved, for all of their unlimited efforts and rectitude. Furthermore, I want to thank the Indonesian Apothecary Association (IAI) for the collaboration and to our sponsors for the generous contributions.

**Dean of the Faculty of Pharmacy, University of Pancasila**
Prof. Shirly Kumala, M.Biomed., Apt

*International Conference on Pharmaceutical Nanotechnology/Nanomedicine,*
*Depok, 9 November 2017*
*Faculty of Pharmacy, University of Pancasila*
*ISBN: 978-602-72418-5-5*

# TABLE OF CONTENT

**Pages**

The Different Chemical Physics And Activities As Anti-Acne Essential Oil Lime Rind (Citrus Hystrix Dc) In The Nanoparticles of Chitosan And Non Nanoparticles Chitosan
Taty Rusliati Rusli, Linda Julianti Wijayadi……..... 1

Effect Of Carbomer 940 Concentration To Physics And pH Characteristics Of Aloe Vera Soothing Gel
Cynthia Marisca Muntu, Endang Wahjuningsih, Sherly Angelia Salim……. 9

The Influence of Storage Temperature To Reconstitution of Methylprednisolone Sodium Succinate Dry Injection on Infusion by HPLC Method
Okpri Meila, Heny Sri Astuti…….. 15

Test Activity Antioxidant And Toxicity Tests of 70% Ethanol Extract Standardized Tin Leaf (Ficus carica L.)
Wiwi Winarti, Meliana Guska, Greesty Finotory Swandiny…… 24

Activity Of Bayam Kakap (Amaranthus hybridus L.) Leaf Ethanol Extract on Ureum and Creatinine Concentration
Nur Rahayuningsih, Mohamad Rizkie Rienaldi, Maritsa Nurfatwa……... 31

Protective Effect of Nanopropolis on Doxorubicin-Induced Cardiotoxicity in Rats
Juniantito V, Prasetyo BF, and Hutasoit TYS…….. 37

Pharmacoeconomic Analysis Of Using Cephalosporin Group In Appendicitis Prophylactic In Rumah Sakit Umum Daerah Subang
Yulia Wardati, Dytha Andri Deswat, and Zainal Muttaqin……. 43

Preparation And Characterization Of Brown Seaweed (*Sargassum polycystum*) Nanoparticles With Sodium Trypolyphosphate And Sodium Alginate As Cross-Linker
Kartiningsih, Stephanie……... 55

Qualitative Evaluation of Antibiotic Usage with Gyssens Criteria at a Perinatology Unit of a Hospital in Bandung, Indonesia
Widyastiwi, Joseph Iskendiarso Sigit…….. 60

Virtual Screening of Compounds in Piperaceae Plants as Ligands on Estrogen Receptor Alpha (ER-α )
Esti Mumpuni, Rodelaide…… 69

Molecular Docking of Apigenin Derivative Compounds as Antioxidant Acting as Human Tyrosine Kinase Inhibitor
Esti Mulatsari, Esti Mumpuni…….. 75

Level of Toxicity and Phytochemical Screening of Lansau Traditional Medicine of Muna Tribe from South East Sulawesi
Sunandar Ihsan, Henny Kasmawati, Suryani, Nur Samsiar, Elsa Alexander, Ardiyanti, Zulfikar Tahir, Rahmat Darmawan, Ruslin……..... 82

*ISBN: 978-602-72418-5-5*

Formulation Of Antiinflammatory Instant Granule Containing Piper sarmentosum Roxb. Leaves Extract
Fahleni, Agnes Ivana……... 88

Combination of TLC-Densitometry Fingerprint Analysis with Chemometrics And α-Glucosidase Inhibitory Activity of Bitter Leaf (Vernonia amygdalina Del)
Zuhelmi Aziz, Mohamad Rafi, Nabella Amulia……... 93

Antioxidant Activity Test of Dates and Dates Jam Using ABTS Free Radical Absorbtion Method
Jessika Ferdiana, Setyorini Sugiastuti…….. 101

Antioxidant Activity Test of Fresh Dayak Onions Bulb, Chopped and Powder Using ABTS Free Radical Scavenging Method
Benny Wijaya, Setyorini Sugiastuti……. 106

*International Conference on Pharmaceutical Nanotechnology/Nanomedicine,*
*Depok, 9 November 2017*
*Faculty of Pharmacy, University of Pancasila*
*ISBN: 978-602-72418-5-5*

# Effect Of Carbomer 940 Concentration To Physics And pH Characteristics Of Aloe Vera Soothing Gel

Cynthia Marisca Muntu[1]*, Endang Wahjuningsih[1], Sherly Angelia Salim[1]
[1] *Department of Pharmaceutics, University of Surabaya (UBAYA), Surabaya, 60293, Indonesia*
*cynthia_muntu@staff.ubaya.ac.id*

## Abstract

Soothing gel is a multi-purpose gel which can be used for many purposes include prevention of dry skin. This research aimed to investigate the change of the physics characteristics and pH of Aloe vera soothing gel. Concentration ratio of carbomer 940 as gelling agent and triethanolamine as the basis gel was 1:1. This research compared three different formulas that contain different variation of carbomer concentration which were formula I with 0.6% concentration, formula II with 0.8% concentration, and formula III with 1% concentration. The parameters of physics characteristics and pH were observed. The parameters were organoleptic, viscosity, flow properties, spreadability capability, specific gravity, and pH. The research was conducted in three replication in each formula. The results showed that all formulas fulfilled all specifications. The carbomer concentration affected to the viscosity, spreadability capability and specific gravity characteristics of the soothing gel, but it did not affect to the organoleptic, flow properties and pH of soothing gel. This study revealed that Formula I was the best formula based on soothing gel specification.

***Keywords*:** characteristics_1, soothing gel_2, carbomer_3, triethanolamine_4, *Aloe vera*_5

## Introduction

Skin had a natural protective factor, but it was not sufficient so it needs additional protection which is given by moisturizing cosmetics. Commonly, moisturizing cosmetics can form surface artificial skin fat to flex dry and coarse skin layers (Surjushe et al, 2008). Soothing gel is a multi-purpose gel, which can be used for various purposes and dry skin, inflammation, burns, eczema, and sunburn (Rajeswari, 2012). Aloe vera had many potential active substances such as vitamins, enzymes, minerals, lignin, saponins, salicylic acid, and amino acids. It can be used as moisturizer for various skin problems (Surjushe et al, 2008).

Gelling agent is one of the excipients that is used in the formulation of soothing gel. Carbomer is a gelling agent which is usually used in gel bases. Each end of carbomer's chain has an acidic carboxylic group when reacted to water. Neutralizing base such as triethanolamine (TEA) could neutralize carbomer because gel formation will be formed at pH 6. The addition of TEA might also form carbomers into a fluffy and transparent gel (Khaerunnisa RR, 2015). Based on previous study, ratio of carbomer 940 and triethanolamine 1: 1 with concentration 0,6% (Formula I), 0,8% (Formula II), and 1% (Formula III) were used in this study. Chosen carbomer concentration were used in consideration of uses of carbomer

*ISBN: 978-602-72418-5-5*

as a gelling agent are 0.5%-2% concentration range according to the Handbook of Pharmaceutical Excipients 6th edition.

This research aimed to investigate the change of the physics characteristics and pH of Aloe vera soothing gel. The parameters of physics characteristics and pH were observed. The parameters were organoleptis, viscosity, flow properties, spreadability capability, specific gravity, and pH. The research was conducted in three replication in each formula.

## Material and methods

### INSTRUMENTS

Analytical balance (OHAUS), homogenizer (Multimix), *water bath*, pH meter (SCHOTT 808)

### MATERIALS

All three formulas contained of Aloe vera powder extract 0.5%, Sodium Metabisulfite 0.011%, Propylene glycol 15%, DMDM Hydantoin 0.5%, aquadem ad 100%. The difference of three formulas were carbomer and triethanolamine concentration which were used as gelling agent in this study. Combination of carbomer 940 and triethanolamine (TEA) with a ratio of 1: 1 with concentrations of 0.6%: 0.6% (Formula I), 0.8%: 0 , 8% (Formula II), 1%: 1% (Formula III) as shown in Table 1.

### METHODS

#### Data Collection Procedures

*Formulation of Soothing Gel*

Gel was prepared by dissolved carbomer into the water then heated on waterbath (70$^{o}$C) and stirred with homogenizer. Triethanolamine solution was mixed and stirred into gel until it reached the specified pH and ideal mass gel was formed.

*Physics Characteristics and pH Evaluation*

The parameters of physics characteristics and pH were observed. The parameters were organoleptis, viscosity, flow properties, spreadability capability, density, and pH. The research was conducted in three replication in each formula.

*Data analysis*

Effect of carbomer and TEA concentrations on soothing gel characteristics were statistically analyzed by one-way anova analysis.

## Result and Discussion

Organoleptic characteristic results of Formula I, Formula II, and Formula III showed similarity of shape and appearance. All three formulas had transparant appearance and formed a gel mass that fulfilled the organoleptic specification as shown in Figure 1 and Table 2. Difference of carbomer concentration didn't affect to organoleptic result.

Viscosity testing results (27$^{o}$C and RH 62%) of all three formulas on Cone and Plate Brookfield Viscometer (0,5 rpm) fulfilled the specification as shown in Table 2. Viscocity p value of one way anova statistic was 0.00 as shown in Table 4. p value less than 0,05 showed that difference

*ISBN: 978-602-72418-5-5*

of carbomer concentration affected to viscosity. Formula 3 had the highest viscosity because gel viscosity was affected by gelling agent concentration. Viscosity was influenced by several factors such as mixing or stirring factor during the preparation process, the selection of gel and humectant base (Ansel, 1989). In this study, increase of gel viscosity was influenced by concentration of carbomer 940 and TEA with concentration of 1%. Carbomer was dispersed into the water formed a cloudy acid solution, this turbidity was occurred due to the carboxylic acid which was released from the acrylic acid polymer. It was neutralized with a strong base and formed a mass gel (Septiawan, 2012).

Flow properties can be classified by observation results of viscosity at different rate of shear (rpm). The flow properties of all three formulas were pseudoplastic as shown in Table 3. This properties will provide a decrease in viscosity with an increase in rate of shear (rpm). This arc rheogram was occurred due to the action of shearing against polymer molecules. With an increase of shearing stress, normally irregular molecules begin to form long axes in the flow direction and the internal resistance of the polymer material in the liquid dispersion was reduced, resulting in larger rate of shear at each shearing stress until the viscosity decreased. Gel had a pseudoplastic flow which will be solid when stored and melted if shaken (Ministry of Health RI, 1995). After the formulation, an increase in carbomer concentration did not change the flow properties, due to the same gelling agent that was used in this study.

Spreadibility capability testing aimed to know the rate of gel spread when applied to the skin (Voight, 1994). Ideal gel spreads between 5 to 7 centimetres (cm) (Garg et al 2002). An ideal gel took less time to spread and had high diameter of spreads (Madan and Singh, 2010). This might be affected by the viscosity of the preparation. The viscosity of the gel preparation was inversely proportional to the spreadability capability. Lower viscosity results in greater diameter of spreads as it was easier to flow. Based on those results, all of three formulas fulfilled the specified specification that was 5-7 cm as shown in Figure 2. The p value of the one-way ANOVA statistical analysis results was 0.000. These results showed an increase of gelling agents concentration affected to spreadability capability. It was occured due to the higher concentration of gelling agent (Carbomer 940), resulted on a decrease of spreadability capability.

Specific gravity was defined as the ratio of the density of a substance to the water density, the value of the two substances was determined at the same temperature (Sinko, 2011). Density was defined as ratio of the mass to the volume, or the weight of substances per unit volume. Specific gravity might be affected by temperature, mass of substance, substance volume and viscosity of a substance (Sinko, 2011). All three formulas fulfilled the specifications. The p value of the one-way ANOVA statistical analysis result was 0.000. This result showed that the increase in gelling agent concentration affected to the specific gravity, because of the swelling potential resulted on increase of gel volume. It was occurred because the specific gravity decreased with increase of concentration.

A pH evaluation was necessary to determine the safety of the gel. The determined pH value is $5.80 \pm 0.05$, because of the consideration of skin pH range between 4.5-6.5. Results of one way ANOVA statistic analysis showed no significant difference with $p > 0,05$. It was occurred because of the same ratio of carbomer and TEA concentrations used in this study. Increase of carbomer concentration was followed by the increase of triethanolamine concentration as the

*ISBN: 978-602-72418-5-5*

base of gel base. This results showed the gelling agent concentration did not affect the pH of soothing gel.

## Conclusion

Based on these results, all three formulas fulfilled the determined specification. Changes in carbomer concentration which was used as a gelling agent on soothing gel formula were observed in this study. The carbomer concentration affected to the viscosity, spreadability capability and specific gravity characteristics of the soothing gel, but it did not affected to the organoleptic, flow properties and pH of soothing gel. This study revealed that Formula I was the best formula based on soothing gel specification.

## Acknowledgement

Thanks to Lembaga Penelitian dan Pengabdian Masyarakat University of Surabaya on a research grant awarded for this research.

## References

Ansel, C.H. (1989). *Pengantar Bentuk Sediaan Farmasi*. Penerjemah: Farida Ibrahim. Cetakan Pertama. Edisi IV. Penerbit UI Press. Jakarta: Hal. 112-115

Departemen Kesehatan RI, 1995, *Farmakope Indonesia* Edisi IV, Jakarta : Departemen Kesehatan Republik Indonesia, 7

Garg, A., Aggarwal, D., Garg, S., and Sigla, A.K., 2002, Spreading of Semisolid Formulation: An Update, Pharmaceutical Tecnology, September 2002, 84- 102

Khaerunnisa RR dkk, 2015, *Formulasi dan Uji Efektivitas Sediaan Gel Antiseptik Tangan Mengandung Ekstrak Etanol Daun Mangga Arumanis (Mangifera indica L.)*, Program Studi Farmasi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Prosiding Penelitian SPeSIA Unisba, ISSN 2460-6472

Madan, J., & Singh, R., 2010, Formulation and Evaluation of Aloevera Topical Gels, Int.J.Ph.Sci., 2 (2), 551-555.

Rajeswari R et al, 2012, *Aloe vera: The Miracle Plant Its Medicinal and Traditional Uses in India*, Journal of Pharmacognosy and Phytochemistry, Volume 1 Isue 4

Septiawan D, 2012, *Perbandingan Variasi Jumlah Triethanolamine Terhadap Stabilitas Fisik dan Sifat Kima Gel Antiseptik Ekstrak Bunga Rosella (Hibiscus sabdariffa L.)*, Surakarta, Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Sebelas Maret

Sinko, P.J., 2011, Martin's Physical Pharmacy and Pharmaceutical Sciences, 6th ed.

Surjushe A. Vasani R. Spale DG., 2008, *Aloe vera : A Short Review*, Indian Journal of Dermatology, 53(4):163-166

Voigt, R., 1994, *Buku Pelajaran Teknologi Farmasi Industri*, Edisi kelima, Gadjah Mada University Press : Yogyakarta, hal.378-384.

*ISBN: 978-602-72418-5-5*

## Tables & Figures

| Materials | Concentrations (%) | | |
|---|---|---|---|
| | Formula I | Formula II | Formula III |
| *Aloe vera* extract | 0,5 | 0,5 | 0,5 |
| Sodium Metabisulfite | 0,05 | 0,05 | 0,05 |
| Propylene glycol | 15 | 15 | 15 |
| *Carbomer* 940 | 0,6 | 0,8 | 1 |
| TEA | 0,6 | 0,8 | 1 |
| DMDM hydantoin | 0,5 | 0,5 | 0,5 |
| Aqua demineralisata | Ad 100 | Ad 100 | Ad 100 |

Table 1. Formula of Soothing Gel Formula I, Formula II, Formula III

| Parameters | Formula | Results | Specification |
|---|---|---|---|
| Organoleptic | Formula I | Transparant Gel | + |
| | Formula II | Transparant Gel | + |
| | Formula III | Transparant Gel | + |
| Viskosity | Formula I | 14980 ± 121,66 cps | + |
| | Formula II | 19122,22 ± 183,56 cps | + |
| | Formula III | 27864,44 ± 192,10 cps | + |
| Flow Properties | Formula I | Pseudoplastic | + |
| | Formula II | Pseudoplastic | + |
| | Formula III | Pseudoplastic | + |
| Specific Gravity | Formula I | 1,0864 ± 0,0490 | + |
| | Formula II | 1,00 ± 0,00 | + |
| | Formula III | 0,8727 ± 0,0546 | + |
| Spreadability Capability | Formula I | 6,24 ± 0,0527 cm | + |
| | Formula II | 5,63 ± 0,0707 cm | + |
| | Formula III | 5,31 ± 0,0601 cm | + |
| pH | Formula I | 5,85 ± 0,0260 | + |
| | Formula II | 5,84 ± 0,0213 | + |
| | Formula III | 5,84 ± 0,0105 | + |

Table 2. Observation of Physical Parameters and pH of Soothing Gel

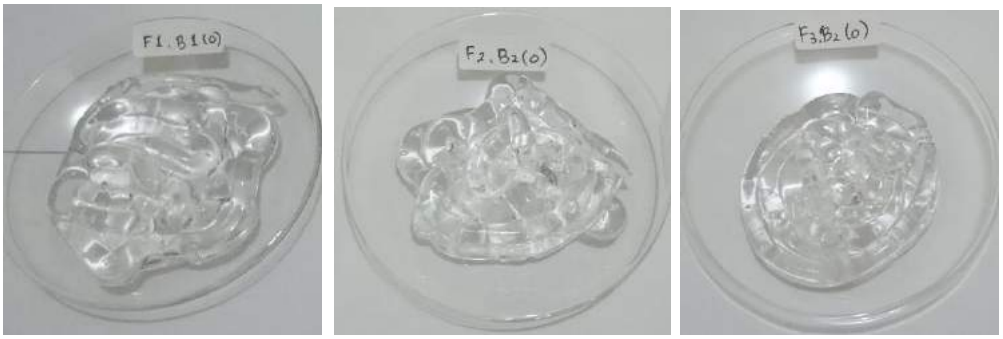
*ISBN: 978-602-72418-5-5*

| Rpm | Viscosity (cps) | | |
|---|---|---|---|
| | Formula I | Formula II | Formula III |
| 0,5 | 14980 | 19122,22 | 27864,44 |
| 1,0 | 9072,67 | 10436,11 | 15484,22 |
| 2,0 | 5244,67 | 6381,11 | 9538,11 |
| 2,5 | 4123 | 4997,67 | 7045,11 |
| 4,0 | 3004,89 | 3504,22 | 4830 |
| 5,0 | 2004,89 | 2662,67 | 3598,22 |
| 10 | 1161,02 | 1525,3 | 1887,33 |
| 20 | 712,756 | 918,79 | 992,14 |
| 50 | 395,08 | 409,18 | 27864,44 |

Table 3. Observation of Flow Properties Based on Viscosity Data

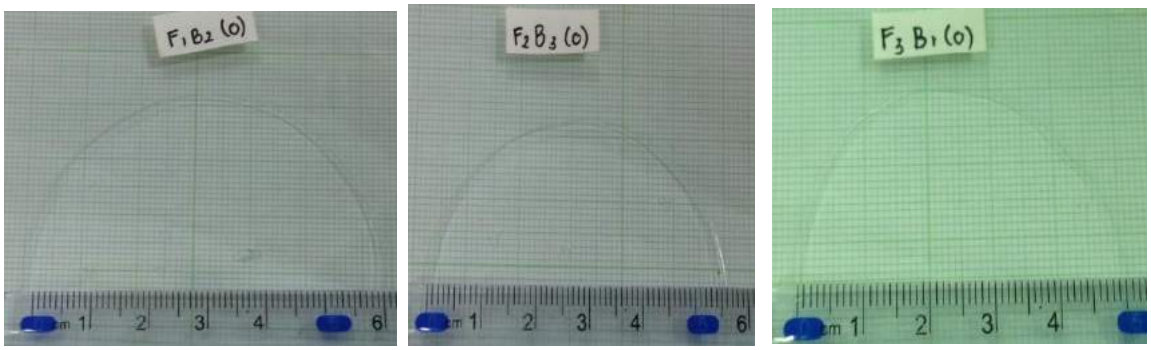
| **P Value** | | | |
|---|---|---|---|
| **Viskositas** | **Daya Sebar** | **Berat Jenis** | **pH** |
| 0,000 | 0,000 | 0,000 | 0,278 |

Table 4. p Value of One Way Anova Statistical Analysis of Viscosity, Spreadability, Specific Gravity and pH




(a) (b) (c)

Figure 1. Organoleptic Results of Soothing Gel Formula I (a), Formula II (b), Formula III (c)




(a) (b) (c)

Figure 2. Spreadability Capability Testing Results of Formula I (a), Formula II (b), Formula III (c)