

BAB V

SIMPULAN DAN SARAN

5.1 Simpulan

Berdasarkan hasil penelitian yang telah dilakukan, konsentrasi PVA berpengaruh untuk meningkatkan viskositas, menurunkan daya sebar, dan meningkatkan waktu kering. Konsentrasi HPMC berpengaruh untuk menurunkan viskositas, meningkatkan daya sebar dan waktu kering. Konsentrasi etanol dapat berpengaruh meningkatkan viskositas, daya sebar dan waktu kering. Interaksi ketiganya meningkatkan viskositas, menurunkan daya sebar, dan meningkatkan waktu kering sediaan masker wajah gel *peel-off*.

Hasil dari optimasi, memberikan formula optimum sediaan masker wajah gel *peel-off* dapat diperoleh menggunakan konsentrasi kombinasi PVA 9,08%, HPMC 0,95%, dan etanol 18,77% dengan prediksi memiliki mutu fisik dan efektivitas yang memenuhi persyaratan dengan nilai viskositas sebesar 8512,135 cPs, daya sebar 6,883 cm, waktu mengering 10,977 menit, terasa kencang, elastis dan mudah dibersihkan.

5.2. Saran

Pada penelitian ini disarankan untuk melakukan penelitian lebih lanjut dengan penambahan bahan alam untuk mendapatkan hasil yang mampu memberikan manfaat dalam penggunaan produk kosmetik “*Skin Care*” sehingga formula optimum dapat dikembangkan dalam industri kosmetik.

DAFTAR PUSTAKA

- Ansel, C.H. 1989, *Pengantar Bentuk Sediaan Farmasi*, Diterjemahkan dari Bahasa Inggris oleh Farida Ibrahim Ed. IV, UI Press, Jakarta, pp. 390, 489.
- Aswal, A., Kalra, M. and Rout, A. 2013, Preparation and Evaluation of Polyherbal Cosmetic Cream, *Der Pharmacia Lettre*, **5(1)**: 83-88.
- Badan Pengawas Obat dan Makanan Republik Indonesia (BPOM RI), 2011, Peraturan Kepala Badan Pengawas Obat dan Makanan no. Hk. 03.1.23.12.11.10052 tahun 2011 tentang Pengawasan Produksi dan Peredaran Kosmetika, Jakarta.
- Barnard, C. 2011, Investigating the effect of various film-forming polymers on the evaporation rate of a volatile component in a cosmetic formulation, *Dissertation*, Master Degree in chemistry, Nelson Mandela Metropolitan University.
- Barry, B. W. 1988, Topical preparations, in *Pharmaceutics: the Science of Dosage Form Design*, M. E. Aulton (ed.). Churchill Livingstone, New York, 381-411.
- Barel, A.O., Paye M., and Maibach, H. I. 2009, *Handbook of Cosmetic Science and Technology*, 3 Ed., New York: Informa Healthcare USA, Inc. pp. 233, 261-262.
- Becker, L. 2014, *Safety Assessment of Glycerin as Used in Cosmetics*, Cosmetic Ingredient Review, Washington DC.
- Bergo, P., and Sobral, P.J.A. 2007, Effect of Plasticizers on Physical Properties of Pigskin Gelatin Films, *Food Hydrocolloids* **21(8)**: 1285-1289.
- Beringhs, A. O., Rosa, J.M., Stulzer, H.K., Budal, R.M. and Sonnagli, D. 2013, Green Clay and Aloe Vera Peel-off Facial Mask: Response Surface Methodology Applied to the Formulation Design, *AAPS PharmSciTech*, **14(1)**: 445-455.
- Bertuzzi, M. A., Gottifredi, J. C., and Armada, M., 2012, Mechanical Properties of a High Amylose Content Corn Starch Based Film, Gelatinized at Low Temperature, *Brazilian Journal of Food Technology*, Campinas, Argentina, **15(3)**: 219-227.
- Birck, C., Degoutin, S., Tabary, N., Miri, V., and Bacquet, M. 2014, New Crosslinked Cast Film Based on Poly (vinyl alcohol): Preparation

- and Physic-chemical Properties, *Express Polymer Letters*, **8(12)**:941-952.
- Bolton, S. and Bon, C. 2004, *Pharmaceutical Statistic: Practical and Clinical Application*, 4th ed., Marcel Dekker, Inc., New York. 425-434, 508-515.
- Boundless, 2015, Structure of the Skin: Dermis. Diakses pada 2 September 2016,<https://www.boundless.com/physiology/textbooks/boundless-anatomy-and-physiology-textbook/the integumentary system/5/the skin-64/structure-of-the-skin-dermis-395-7489/>.
- Buhse, L., Kolinski, R., Westenberger, B., Wokovich, A., Spencer, J., Chen, C.W., Turujman, S., Basak, M.G., Kang, G.J., Kibbe, A., Heintzelmen, B. and Wolfgang, E. 2005, Topical Drug Classification, *International Journal of Pharmaceutics*, **295**: 101-112.
- Brooks, A., Elliott, R.P. and McKay, B.G.R. 2004, *Film-Forming Compositions for Topical Application*, United Stated Patent.
- Chan, L.W., Hao, J.S., and Heng, W.S. 1999, Evaluation of Permeability and Mechanical Properties of Composite Polyvinyl Alcohol Films, *Chemical and Pharmaceutical Bulletin*, **47(10)**: 1412-1416
- Cini, J. and Finkenaur, A. 1998, *Gel Formulation Containing Growth Factors*, Ethicon, Inc., USA, P. 4.
- Darsika, C., Sowmya, K. V., Suganya, K., Fatima, X. G. And Shanmuganathan, S. 2015, Preparation and Evaluation of Herbal Peel Off Face Mask, *American Journal of Pharmtech Research*, **5 (4)**: 2249-3387.
- Departemen Kesehatan RI, 1985, *Formularium Kosmetika Indonesia*, Jakarta: Departemen Kesehatan Republik Indonesia.
- Departemen Kesehatan RI, 1995, *Farmakope Indonesia Edisi IV*, Jakarta:Departemen Kesehatan Republik Indonesia.
- Departemen Kesehatan RI, 2014, *Farmakope Indonesia Ed V*, Departemen Kesehatan Republik Indonesia, Jakarta.
- Final Report of the Cosmetic Ingredient Review Expert Panel, 2009, *Amended Safety Assesment of Cellulose and Relatet Polymers as used in Cosmetics*, Washington, DC 20036-4702.

Final Report in the Safety Assessment of Polyvinyl Alcohol, 1998, Reviewed by the Cosmetic Ingredient Review Expert Panel, *International Journal of Toxycology*, **17**: 67-92.

Garg, A., Aggarwal, D., Garg, A. and Sigla, A.K. 2002, Spreading od Semisolid Formulation, *Pharmaceutical Technology*, p.84-105.

Gaudin, S., Lourdin D., Le Botlan, D., Ilari, J.L., and Colonna, P. 1999, Plasticization and Mobility in Starch-Sorbitol Films, *Jurnal of Cereal Science* **29(3)**: 273-284

Glicksman. 1983. Food Hydrocolloids. CRC Press. Boca Raton FL.

Harris, H. 2001, Kemungkinan Penggunaan *Edible Film* dari Tapioka untuk Pengemas Lempu, *Jurnal Pertanian Indonesia* **3(2)**: 99-106

Harry, R.G. 1973, Harry's Cosmeticology, Ed 6th ,Chemical Publishing Co., Inc, New York.

Hassan, C. M and Peppas, N. A. 2000, Structure and Application of Poly(vinyl alcohol) Hydrogels Produced by Convention Crosslinking or by Freezing/Thawing Methods, *Advance in Polymer Science*, **153**, Springer-Verlag, Berlin Heidelberg.

Jayronia, S. 2016, Design and Development of Peel-Off Mask Gel Formulation of Tretinoin for Acne Vulgaris, *World Journal of Pharmacy and Pharmaceutical Sciences*, **5(11)**: 928-038.

Jones, D.S. 2010, *Statistik Farmasi*, Penerbit Buku Kedokteran : EGC

Junqueira, L.C. and Kelly, O. R., 1997, *Histologi Dasar*, diterjemahkan dari bahasa Inggris oleh Jan Tambo yang, EGC, Jakarta.

Kartika, B. 1991, *Uji Mutu Pangan*, Proyek Peningkatan Perguruan Tinggi Universitas Gajah Mada, Yogyakarta, Hal 107-111, 199.

Khan, M.I., and Nasef, M.M. 2009, Spreading Behavior of Silicone Oil and Glycerol Drops on Coated Papers, *Leonardo Journal of Sciences* **14** : 18-30.

Kibbe, A. H., 2004 *Handbook of Pharmaceutical Exipients* , Third Edition, 18-19, 462-469, 629-631, Pharmaceutikal Press, London.

Kuncari, E. S., Iskandarsyah dan Praptiwi, 2014, Evaluasi, Uji Stabilitas Fisik Dan Sineresis Sediaan Gel yang Mengandung Minoksidil, Apigenin dan Perasan Herba Seledri (*Apium Graveolens* L.). *Bulletin Penelitian Kesehatan*. **42(4)**: 213-222.

- Kurniawan, D.W., dan Sulaiman, S.T.N. 2009, *Teknologi Sediaan Farmasi, Graha Ilmu*, Yogyakarta, hal.70-84, 91-102.
- Lachman, L., Herbert, A.L., and Joseph, L.K. 1994, *Teori dan Praktek Farmasi Industri*, Ed. III, Jakarta: UI Press, p.1091-1092
- Lieberman, Rieger and Bunker, 1989, *Pharmaceutical Dosage Form : Disperse System*. Vol 2. New York: Marcel Dekker Inc. 495-498.
- Lin, C.A. and Ku, T.H. 2008, Shear and Elongational Film Properties of Thermoplastic Polyvinyl Alcohol Melts with Different Plasticizer Contents and Degree of Polymerization, *Journal of physical Chemistry*, C111:13696-13700.
- Marten, F.L. 2002, *Vinyl Alcohol Polymers*, Encyclopedia of Polymer Science and Technology. John Wiley and Sons, Inc, USA.
- Martin, A., Swarbrick, J., dan Cammarata, A. 1993, *Physical Pharmacy*, Edisi 3, diterjemahkan oleh Yoshita, Lea and Febiger, Washington, Philadelphia, 1083-1096, 1170.
- Mitsui, T. 1997, *New Cosmetic Science*, Shiseido Co., Amsterdam, p. 329.
- Morgan, G., 1992, 'Beauty Mask', in Balsam, M. S., Gershon, S. D., Riegerm, M. M., Sagarin, E., and Strianse, S. J., *Cosmetic Science and Technology*, 2nd ed., Krieger Publishing Company, Florida.
- Morris, K. 1993, *Depilatories Mask Scrubs and Bleaching Preparation*, Paucher's Perfumes Cosmetics and Soaps Hieda Butler, Chapman and Hall, London
- Mutchler, Ernst. 1991, *Dinamika Obat*, edisi V, terjemahan M.B Widianto dan A.S Ranti, ITB, Bandung, 577.
- Nawanopparatsakul, S., Euasathien, J., Eamtawecharum, C., Benjasirimingokol, P., Soiputtan, S. and Pacchamud, P.T. 2005, Skin Irritation Test of Curcuminoids Facial Mask Containing Chitosan as a Binder, *Silpakorn University International Journal*, 7(1-2): 140-147.
- Ogur, E. 2005, *Polyvinyl Alcohol: Materials, Processing and Applications*, United Kingdom:Smithers Rapra Technology.
- Pearce, E. 2004. *Anatomi dan Fisiologi Untuk Paramedis*. Gramedia, Jakarta.

- Pena, I. E. 1990, Gel dosage forms: theory, formulation and processing. In Osborne. D. W. and Amann, A. H., *Topical Drug Delivery Formulations*, Marcel Dekker INC, New York, 381-388.
- Personal Care Products Council. 2013, *Concentration of Use by FDA Product Category : Polyvinyl Alcohol*, Personal Care Products Council.
- Rana, S. 2013, *Optimisation and Development of the Peel-Off Gel Formulation for The Decontamination of The Radiological Contaminants from Skin*, Toxicity and Efficacy Studies on Radioactive Decontamination Formulations, Thesis, Institute of Nuclear Medicine and Allied Sciences (INMAS), Dehli, India.
- Reed, T., Barret, A.H., Briggs, J., and Richardson, M. 1998, Texture and Storage Stabiloty of Processed Beefstick as Affected by Glycerol and Moisture Level, *Journal Food Science* **63**: 84-87.
- Rieger, M. M., 2000, *Harry's Cosmeticology*, 8th ed., Chemical Publishing Co, Inc., New York.
- Rowe, R.C., Sheskey, P.J. and Quinn, M. E. 2009, *Handbook of Pharmaceutical Excipients*, 6th ed., Pharmaceutical Press, London.
- Santanu, R., Hussan, S.D., Rajesh, G., and Daljit, M. 2012, A Review On Pharmaceutical Gel, *International Journal of Pharmaceutical Research and Bio-Science*, **1(5)**: 21-36
- Saxena, S.K. 2004, *Polyvinyl Alcohol (PVA)*, Chemical and Technical Assesment (CTA) 61th JECFA.
- Setiadi. 2007, *Anatomi dan Fisiologi Manusia*, Graha Ilmu, Jakarta: 26.
- Shai, A., Maibach, H.I. and Baran, P. 2009, *Handbook of Cosmetic Skin Care*, Second Edition, Informa Healthcare UK Ltd, London. 44.
- Tay, S. 2009, *The Carer's Cosmetic Handbook: Simple Health and Beauty Tips for Older Persons*, Jessica Kingsley Publisher,UK and USA.
- Toedt, J., Koza, D. and Van Cleef-Toedt, K. 2005, Chemical Composition of Everyday Production, Greenwood Press, London, pp. 30-33
- Tranggono, R.I. dan Latifah, F. 2007, *Buku Pegangan Ilmu Pengetahuan Kosmetika*, PT Gramedia Pustaka Utama, Jakarta.
- Tresna, P. 2010, *Modul I Dasar Rias Perawatan Kulit Wajah (Facial)*, Jurusan Pendidikan Kesejahteraan Keluarga, Universitas Pendidikan Indonesia, Bandung.

- Ulaen, S.P.J., Banne, Y., dan Suatan, R.A., 2013, Pembuatan Salep Anti Jerawat dari Ekstrak Rimpang Temulawak (*Curcuma xanthorrhiza* Roxb.), *Jurnal Poltekkes Kemenkes Manado*, Manado.
- Vieira, R. P., Fernandes, A. R., Kaneko, T. M., Consiglieri, V. O., Pinto, C.A. S., Pereira, C. S. C., Baby, A. R., and Velasco, M. V. R., 2009, Physical and Phisicochemical Stability Evaluation of Cosmetic Formulation Containing Soybean Extract Fermented by Bifidobacterium Animalis, *Journal of Pharmaceutical Sciences*, Brazilian.
- Voigt, R., 1994, *Buku Pelajaran Teknologi Farmasi*. Edisi Kelima. Yogyakarta: Gadjah Mada University Press. p. 343.
- Wasitaatmadja, S. M., 2011, *Dasar-Dasar Peremajaan Kulit*, Balai Penerbit FKUI, Jakarta.
- Wilkinson, J.B. and Moore, R.J. 1982, *Harry's Cosmetology : The Principles of Modern Cosmetic*, 7th Editor, Leonard Hill Book, London.
- Zhelsiana, D.A., Pangestuti, Y.S., Nabilla, F., Lestari, N.P. dan Wikantyasning, E.R. 2016, 'Formulasi dan Evaluasi Sifat Fisik Masker Gel Peel-off Lempung Bentonite', The 4th University Research Coloqium, Fakultas Farmasi, Universitas Muhammadiyah Surakarta, pp. 42-45.