DAFTAR PUSTAKA

Agoes, G. 2007. *Teknologi Bahan Alam*. ITB Press, Bandung

Ahmed, K., Yan, L., David, J.M., Hang, X. 2012. Nanoemulsion and Emulsion Based Delivery System for Curcumin: Encapsulation and Release Properties. *Food Chem.* 132(2): 799-807.

Amien, A. I., R. Sohair, B. Fahmy, F. M. Abd-Elgleel, & S. M. Elaskalany. 2015. Renoprotective Effect Of Mangifera Indica Polysaccharides and Silymarin Against Cyclophosphamide Toxicity In Rats. *The Journal of Basic & Applied Zoology*.729(1) : 154–162.

Arditanoyo, K. 2016. Optimasi Formula Gel Hand Sanitizer Minyak Atsiri Jeruk Bergamot Dengan Eksipien HPMC Dan Gliserin. Skripsi. Fakultas Farmasi Universitas Sanata Dharma, Yogyakarta.

Azeem, A., M. Rizwan, F.J. Ahmad, Z. Iqbal, R. Kar, M. Aqil, S. Talegaonkar. 2009. Nanoemulsion Component Screening And Selection : a Technical note. *AAPS PharmSciTech*, 10(1): 69-76.

Balakumar, K., Raghavan, C.V., selvan, N.T., prasad, R.H., dan Abdu, S. 2013. *Self Nanoemulsifying Drug Delivery System* (SNEDDS) of Rosuvastatin Calcium: Design, Formulation, Bioavailability and Pharmacokinetic Evaluation, Colloids and Surfaces B: *Biointerfaces*, 112 (1): 337–343.

Bali, V., Ali, M., Ali, J. 2010. Study of Surfactan Combinations and Development of a Novel Nanoemulsion for Minimizing Variations in Bioavaibility of Exetimibe. *Colloids and Surfaces Bointerfaces.* 76(1): 410-420.

Baloch J, M.F. Sohail, H.S. Sarwar, M.H.Kiani, G.M. Khan, S. Jahan, M. Rafay, M.T. Chaudhry, M. Yasinzai, G. Shahnaz. 2019. *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) for Improved Oral Bioavailability of Chlorpromazine: In Vitro and In Vivo Evaluation. *Medicina*. 55(5): 210-216

Bandivadekar, M., Pancholi, S., Kaul-Ghanekar, R., Choudhari, A., Koppikar, S. 2013. Single Non-ionic Surfactant Based *Self-Nanoemulsifying Drug Delivery Systems*: Formulation, Characterization, Cytotoxicity and Permeability Enhancement Study, *Drug Development and Industrial Pharmacy*, 39 (5): 696-703.

Betti, D., & Astuti. 2010. Pengaruh Sonikasi Terhadap Struktur dan Morfologi Nanopartikel Magnetik yang Disintesis dengan Metode Kopresipitasi. *Jurnal Fisika Unand*. 2(3): 186-189.

Beandrade, M.U. 2018. Formulasi dan Karakterisasi SNEDDS Ekstrak Jintan Hitam (*Nigella sativa*) dengan Fase Minyak Ikan Hiu Cucut Botol (*Cebtriphorus* Sp.) Serta Uji Aktivitas Imunostimulan. *Journal of Pharmaceutical Science and Clinical Research*. 1(1): 50-61.

Bouchemal, K., Briançon, S., Perrier, E., dan Fessi, H., 2004. Nano-emulsion Formulation using Spontaneous Emulsification: Solvent, Oil and Surfactant Optimization, *Int J Pharm*, 280 (1): 241–251.

Date, A., N. Desai. Dixit, R, M. Nagarsenker. 2010. Self-Nanoemulsifying Drug Delivery Systems: Formulation Insights, Applications And Advances. *Nanomedicine (Lond*.). 5(10); 1595- 1616.

Departemen Kesehatan RI. 2017. *Farmakope Herbal Indonesia Edisi II*. Direktorat Jendral Pengawasan Obat dan Makanan, Jakarta.

Diba, Rovie Farah., Sedarnawati Yasni., Sri Yuliani. 2014. Nanoemulsifikasi Spontan Ekstrak Jinten Hitam dan Karakteristik Produk Enkapsulasinya, *Jurnal Teknologi dan Industri Pangan*, 25 (2): 134 – 139.

Ergina., Nuryanti, S., & Pursitasari, I,D. 2014. Uji Kualitatif Senyawa Metabolit Sekunder Pada Daun Palado (Agave angustifolia) Yang Diekstraksi Dengan Pelarut Air Dan Etanol. Jurnal Akademika Kimia. 3(3): 165-172.

Ernawati, E., & A. Nurliani. 2016. Efek Antioksidan Ekstrak Etanol Bulbus Bawang Dayak (*Eleutherine americana* Merr.) terhadap Struktur Mikroanatomi Tubulus Seminiferus Testis Tikus yang Dipapar Asap Rokok. *Jurnal Sains dan Terapan Kimia.* 6 (2) : 93-100.

Florentia S. 2013. Optimasi formula tablet hisap ekstrak buah mahkota dewa (*Phaleria macrocarpa* Sceff Boerl.) menggunakan campuran pengisi laktosa-sorbitol dengan metode *Simplex Latice Design*. *Skripsi.*: Universitas Muhammadiyah, Surakarta.

Fudholi, A. 2013. *Disolusi dan Pelepasan Obat In-vitro*. Pustaka Pelajar, Yogyakarta

Genakela, M.Y. 2014. Formulasi nanoemulsi minyak sawit dengan high pressure homogenizer. *Skripsi*. IPB, Bogor.

Gershanik, T. & Benita, S. 2000. Self-dispersing Lipid Formulations for Improving Oral Absorption of Lipophilic Drugs, *European Journal of Pharmaceutics and Biopharmaceutics,* 50 (1): 179-188.

Ghadave, A.D. 2014. Nanoemulsions: Formation, Stability, and application. *IJRSAT*. 2 (3): 38-43

Gullota , A. Saberi, A.H. Nicoli, M.C & D.J. McClements,. 2014. Nanoemulsions based delivery system for polyunsaturated (omega 3) oils: formations usiong a spontaneous emulsifications method. *Journal og agricultural ang food chemistry*. 62 (7) :1720 – 1725

Gupta, P.K., J.K. Pandit, A. Kumar, P. Swaroop, S. Gupta. 2010. Pharmaceutical Nanotechnology Novel Nanoemulsion High Energy Emulsification Preparation, Evaluation, and Application. *T.Ph.Res.* 3 (3) : 117-138

Gursoy, R.N. & Benita, S. 2004. Self-Emulsifying Drug Delivery System (SEDDS) for Improved Oral Delivery of Lipophilic Drugs, *Biomed and Pharmacother*, 58 (2) : 173-182.

Hakim, Winarti, Suwaldi, Matin. 2018. Formulation of Self Nanoemulsiying Drug Delivery System andIts In Vitro – In Vivo Study. *Indonesian J Pharm.* 29(3): 158-166.

Hanani, E. 2015. *Analisis Fitokimia.* EGC, Jakarta.

Indratmoko, S., A.N. Yulianto, A.A. Herawan. 2020. Pengembangan Nanopartikel Ekstrak Daun Kersen (Muntingia calabura L) dengan Teknik Self-Nanoemulsifying Drug Delivery System (SNEDSS) untuk Aplikasi Antibakteri. *Jurnal Ilmiah Kefarmasian.* 1(2) : 27-29

Indriani, V., N.E.K.P. Tobing, L. Rijai. 2018. Formulasi Self-Nanoemulsifying Drug Delivery System (SNEDDS) Ekstrak Biji Ramania (*Bouea macrophylla* Griff) dengan Asam Oleat (*Oleic acid*) sebagai Minyak Pembawa. *Proceeding of the 8 th Mulawarman Pharmaceuticals Conferences.* Kelompok Bidang Ilmu Farmasetika dan Teknologi Formulasi, Samarinda.

Jaiswal, M., R. Dudhe, P.K. Sharma. 2014. Nanoemulsion : an advandce mode of drug delivery system. *Biotech* 5(2):123-127

Jones, W.P. dan Kinghorn, A.D. 2006. Extraction of plant secondary metabolites, In: Sarker, S.D., Latif, Z. dan Gray, A.I., eds. Natural Products Isolation. 2nd Ed. Humana Press, New Jersey.

Koroleva, M.Y., & E.V. Yurtov. 2012. Nanoemulsions: The properties Methods of Preparation and Promising Applications. *Russian Chemical Reviews*. 81(1) : 21-43

Ling, L. T., S. Yap., A. K. Radhakrishnan, & T. Subramanian. 2009. Standardised Mangifera indica Extract Is an Ideal Antioxidant. *Food Chemistry*. 11(3):1154-1159.

Mahdi, E.S.,Sakeena, M.H.F., Abdulkarim, M.F., Abdallah, G.Z., Satar, M.A., Noor, A.M. 2011. Effect of Surfactan and Surfactan Blends on Pseudoternary Phase Diagram Behaviour of Newly Synthesized Palm Kernel Oil Esters. *Drug Design Development Therapy*. 11(5): 311-323.

Makadia H. A., Bhatt A. Y., Parmar R. B., Paun J. S., dan Tank H. M. 2013. SelfNanoemulsifying Drug Delivery System (SNEDDS): Future Aspects, *Asian J Pharm Res*, 3(1): 21-24.

Mansor, T.S.T., Che Man, Y.B., Shuhaimi, M., Abdul Afiq, M.J., and Ku Nurul, F.K.M. 2012. Physicochemical Properties of Virgin Coconut Oil Extracted from Different Processing Methods, *International Food Research Journal*, 19 (3) : 837-845

Mariana, L., Y. Andayani & E. R. Gunawan. 2013. Analisis Senyawa Flavonoid Hasil Fraksinasi Ekstrak Diklorometana Daun Keluwih (*Artocarpus Camansi*). *Chem. Prog*. 6(2): 50-55.

McClements, D.J. 2012. Nanoemulsions versus microemulsions : Terminology, Differences, And Similarities. *Soft Matter*. 8 (6) : 1719-1729.

Meigaria, K.M., I.W. Mudiantan, N.W. Martiningsih. 2016. Skrining Fitokimia dan Uji Aktivitas Antioksidan Ekstrak Ekstrak Aseton Daun Kelor (*Moringa oleifera*). *Jurnal Wahana Matematika san Sains.* 10(2):1-11

Nareswari, N., & Kuncoro, A. 2016. Pembuatan Salep Minyak Atsiri Daun Jeruk Limau (Citrus amblycarpa) Dan Uji Stabilitas Terhadap Tipe Basis Yang Digunakan. Jurnal Biofarmasi. 14(2): 63-68

Nugroho, B.H., & N.P. Sari. 2018. Fomulasi Self-Nanoemulsifiying Drug Delivery System (SNEDDS) Ekstrak Daun Karamunting (*Rhodomyrtus tomentosa* (Ait.) Hassk). *Jurnal Ilmiah Farmasi*. 14(1) : 1-8

Nurviana, V. 2016. Profil Farmakognosi dan Skrining Fitokimia dari Kulit, Daging, dan Biji Buah Limus (*Mangifera foetida* L). *Jurnal Kesehatan Bakti Tunas Husada.* 16 (1) : 138-139.

Patel, J., Kevin, G., Patel, A., Raval, M., dan Sheth, N. 2011a. Design and Development of a Self-Nanoemulsifying Drug Delivery System for Telmisartan for Oral Drug Delivery, Int J Pharm Investig, 1(1): 112–118.

Patel, J., Patel, A., Raval, M., dan Sheth, N. 2011b. Formulation and Development of a Self-Nanoemulsifying Drug Delivery System of Irbesartan, *J Adv Pharm Technol Res*, 2(1): 9–16.

Pinto Reis, C., Neufeld, R.J., Ribeiro, A.N.J., dan Veiga, F. 2006. Nanoencapsulation I, Methods for preparation of drug-loaded polymeric nanoparticles, Nanomedicine: Nanotechnology, *Biology and Medicine*, 2: 8-21.

Pourmorad, F., S.J, Hosseinimehr, & N, Shahabimajd. 2006. Antioxidant Activity, Phenol and Flavonoid Contents of Some Selected Iranian Medicinal Plants. *African Journal of Biotechnology*. 5: 1142-1145.

Prasetyo A, Sugihartini N. 2015. Optimasi Campuran Manitol-Pemanis Stevia Sebagai Pemanis Tablet Kunyah Ekstrak Jahe merah (*Zingiber officinale Roscoe var.rubrum*) dengan Metode Simplex Lattice Design. *Jurnal Farmasi dan ilmu Kefarmasian Indonesia*. 2 (2) : 53 – 58.

Pratiwi L, Fudholi A, Martien R, Pramono S. 2016. Design and optimization of self-nanoemulsifying drug delivery systems (SNEDDS) of ethyl acetate fraction from mangosteen peel (Garcinia mangostana, L). *Int Journal of Pharm Tech Research* 9 (6): 380-387.

Priani, S.E., Nurrayyan, F. Darusman. 2017. Formulasi *Self Nano-Emulsifying Drug Delivery System* (SNEDDS) Glimepirid Dengan Fasa Minyak Asam Oleat. *Pharmaciana.* 7(2): 267-276.

Puspitasari, A. D. & L. S. Proyogo. 2017. Perbandingan Metode Ekstraksi Terhadap Kadar Fenolik Total Ekstrak Etanol Daun Kersen (*Muntingia calabura*). *Jurnal Ilmiah Cendekia Eksakta*. 1 (1): 1-8.

Rismarika, Indri Maharini, Yusnelti. 2020. Pengaruh Konsentrasi PEG 400 sebagai kosurfaktan pada formulasi nanoemulsi minyak kepayang. *Jurnal Farmasi*. 5(1): 1-14

Rosydah K, Nurmuhaimina SA, Komari N, Astuti MD. 2010. Aktivitas Antibakteri Fraksi Saponin dari Kulit Batang Tumbuhan Kasturi (Mangifera Casturi). *Alchemy.* 1 (2) : 53-103.

Rowe, R.C., Sheskey, P.J., dan Quinn, M.E. 2009. *Handbook of Pharmaceutical Excipients, 6th Edition, sixth. Ed*, Pharmaceutical Press, London.

Shafiq-un-Nabi, S., Shakeel, F., Talegaonkar, S., Ali, J., Baboota, S., Ahuja, A., dkk. 2007. Formulation development and optimization using nanoemulsion technique: a technical note. *AAPS pharmscitech*, 8: E12–E17.

Sa'adah, H., & Nurhasnawati, H. 2015. Perbandingan Pelarut Etanol Dan Air Pada Pembuatan Ekstrak Umbi Bawang Tiwai (Eleutherine americana Merr) Menggunakan Metode Maserasi. Jurnal Ilmiah Manuntung. 1(2): 149-153.

Sari, A., & Maulidya, A. 2016. Formulasi Sediaan Salep Ekstrak Etanol Rimpang Kunyit (Curcuma longa Linn.). SEL. 3(1): 16-23.

Shakeel F, S. Baboota, A. Ahuja, J. Ali, M.S. Faisal, S. Shafiq. 2008. Stability Evaluation Of Celeoxib Nanoemulsion Containing Tween 80. *Thai Journal Pharm Sci*. 2(8): 179-183.

Simaremare, E.S. 2014. Skrining Fitokimia Ekstrak Etanol Daun Gatal (*Laportea decumana* (Roxb) Wedd). *Pharmacy.* 11 (1): 98-107.

Singh, B., Bandopadhyay, S., Kapil, R., Singh, R., dan Katare, O. 2009. Selfemulsifying Drug Delivery System (SEDDS): Formulation Development, Characterization and Applications, *Crit Rev Ther Drug Carrier Syst*, 2 (6): 427–521.

Sutomo, Nadya Agustina, Arnida Arnida, Fadilaturrahmah. 2017. Studi Farmakognostik Dan Uji Parameter Nonspesifik Ekstrak Metanol Kulit Batang Kasturi (*Mangifera Casturi* Kosterm.). *Jurnal Pharmascience*. 4 (1) : 94 – 101

Syukri, Yandi, Ronny, M., Endang, L., Agung, E.N. 2016. Novel Self-Nanoemulsifying Drug Delivery System (SNEDDS) of Andrographolide Isolated From *Andrografis paniculata* Nees. *Journal of Drug Delivery Science and Technology*. 47(1): 514-520.

Tiwari, P., B. Kumar, M. Kaur, G. Kaur, H. Kaur. 2011. Phytochemical Screening And Extraction: a Review. International Pharmaceutica Scciencia. 1(1) : 98-106.

Tjokronegoro. 2003. Beberapa cara meningkatkan motilitas spermatozoa manusia secara in vitro. *Jurnal Kedokteran dan Farmasi*. 9: 825-829.

Vijaya, R.S., Suresh, K., dan Kamalakannan, S. 2015. Preparation an In-Vitro Evaluation Of Miconazole Nitrate Nanoemulsion Using Tween 20 as Chempublish Journal Vol. 5 No. 1 (2020) 1-14 14 Surfactan For

Effrctive Topical/Transdermal Delivery. Journal Of Chemical and Phharmaceutical Sciences. 1(3): 92-98.

Wachidah & L. Nurul. 2013. *Uji Aktivitas Antioksidan Serta Penentuan Kandungan Fenolat dan Flavonoid Total dari Buah Parijoto (Medinilla speciosa Blume).* UIN Syarif Hidayatullah, Jakarta.

Wahyuni, R., Guswandi., & Rivai, H. 2014. Pengaruh Cara Pengeringan Dengan Oven Kering Angin Dan Cahaya Matahari Langsung Terhadap Mutu Simplisia Herba Sambiloto (*Andrographis paniculata* Nees.). Jurnal Farmasi Higea. 6(2): 126-132.

Wahyuningsih, I., & W. Putranti. 2015. Optimasi Perbandingan Tween 80 dan PEG 400 Pada Formula *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Minyak Biji Jintan Hitam. *Journal Pharmacy*. 12(2): 223-241.

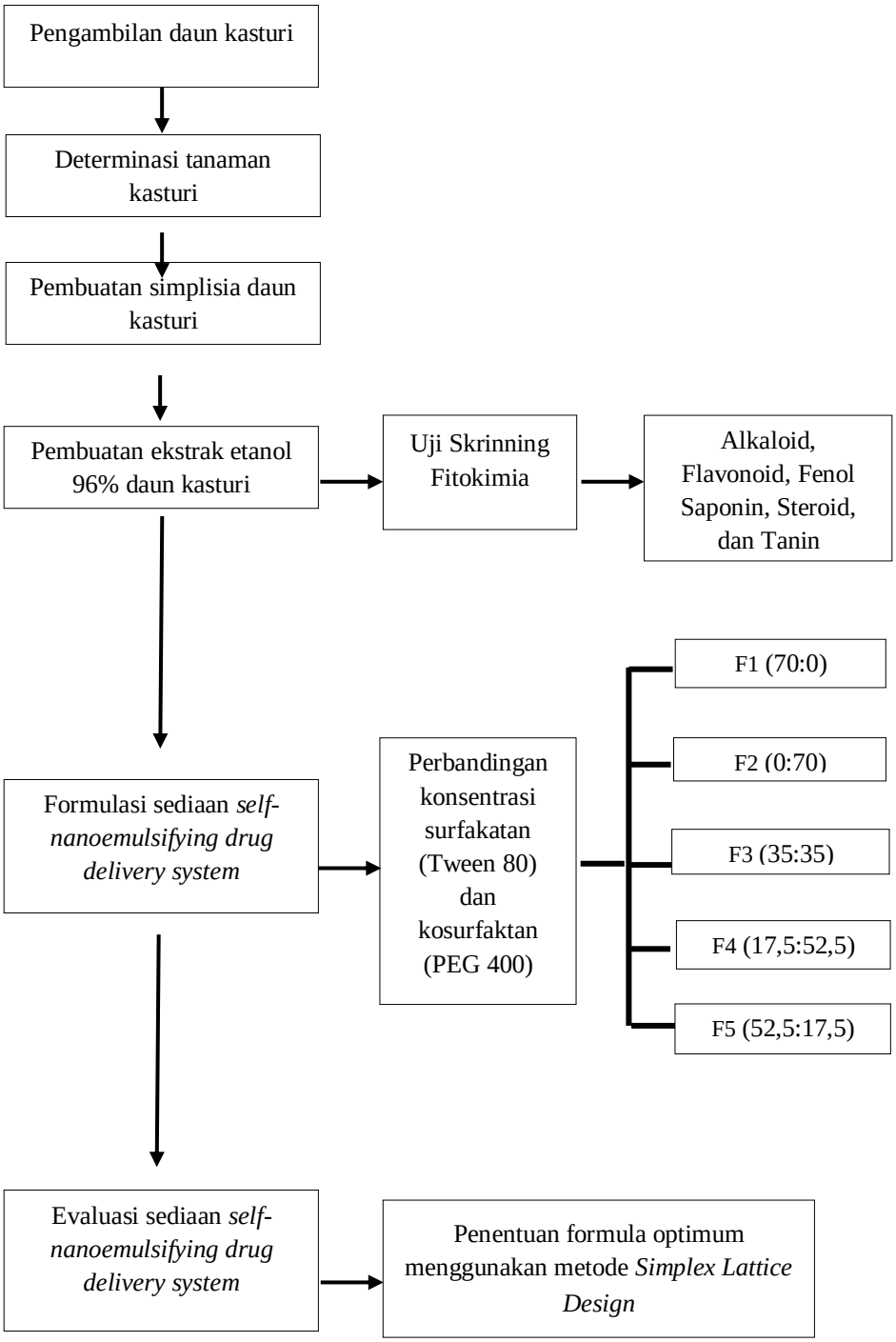
Wijaya, D.P., E.P. Jessy, A. Jemmy. 2014. Skrining Fitokimia dan Uji Aktivitas Antioksidan dari Daun Nasi (*Phrynium capitatum*) dengan Metode DPPH(1,1-difenil-2-pikrilhidrazil). *Jurnal MIPA UNSRA*, Manado

Winari, L., Suwaldi, Ronny, M., Lukman, H. 2016. Formulation of Self-Nanoemulsifying Drug Delivery System of Bovine Serum Albumin Using HLB. *Indonesian J Pharm.* 27(3): 117-127.

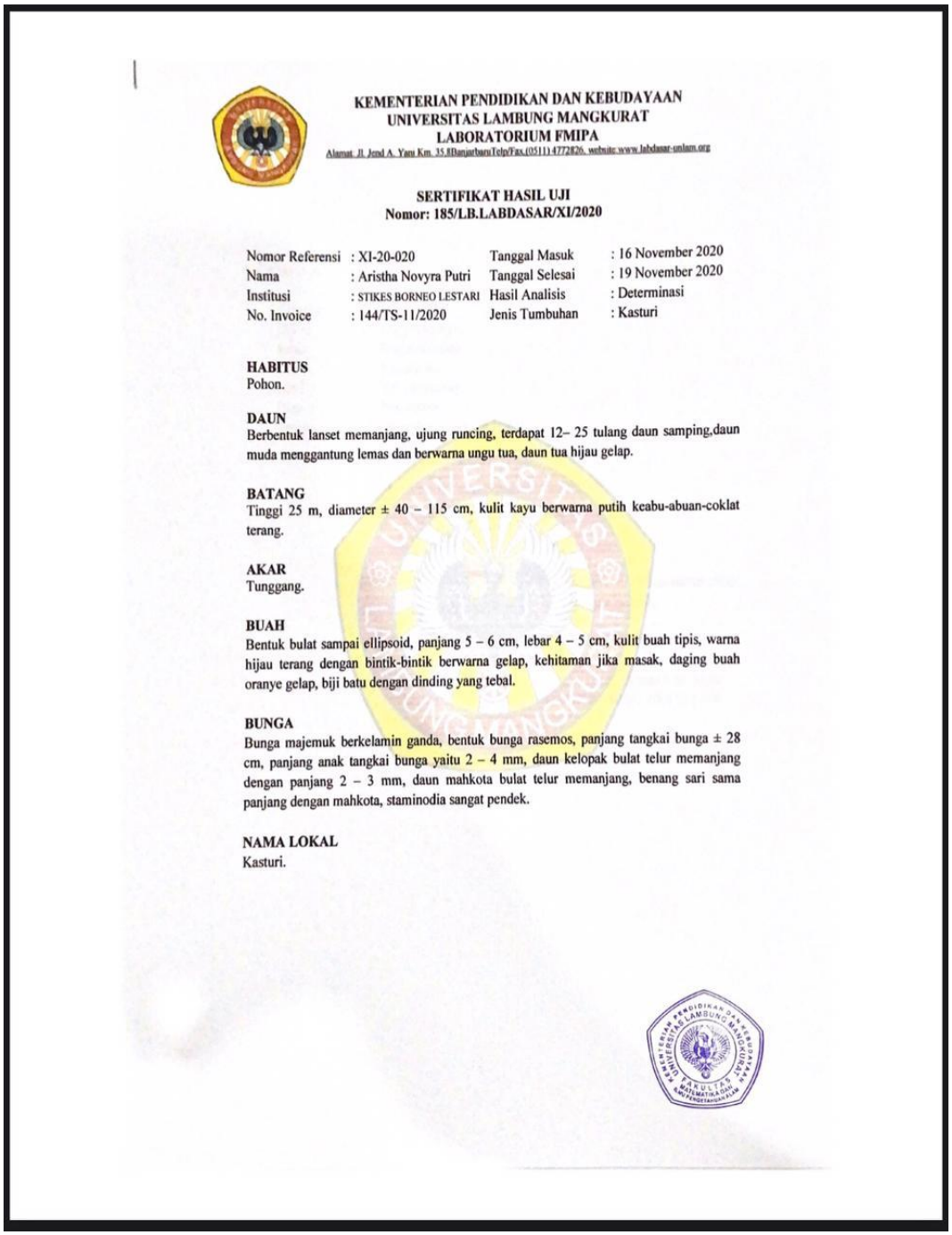
Yakubu, M. T., M.A. Akanji, A.T. Oladiji. 2007. Male Sexual Dysfunction and Methods Used In Assesing Medicinal Plants with Aphrodisiac Potentials: *Pharmacognosy Reviews.* 1(3) : 49-56.

L A M P I R A N

Lampiran 1. Skema Prosedur Penelitian



Lampiran 2 Hasil Determinasi



KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS LAMBUNG MANGKURAT
LABORATORIUM FMIPA
Alamat: Jl. Jend A. Yani Km. 35 Banjarbaru Telp/Fax (0511) 4772826, website: www.labdasar-unlam.org

SERTIFIKAT HASIL UJI
Nomor: 185/LB.LABDASAR/XI/2020

Nomor Referensi	: XI-20-020	Tanggal Masuk	: 16 November 2020
Nama	: Aristha Novyra Putri	Tanggal Selesai	: 19 November 2020
Institusi	: STIKES BORNEO LESTARI	Hasil Analisis	: Determinasi
No. Invoice	: 144/TS-11/2020	Jenis Tumbuhan	: Kasturi

HABITUS
Pohon.

DAUN
Berbentuk lanset memanjang, ujung runcing, terdapat 12– 25 tulang daun samping,daun muda menggantung lemas dan berwarna ungu tua, daun tua hijau gelap.

BATANG
Tinggi 25 m, diameter ± 40 – 115 cm, kulit kayu berwarna putih kcabu-abuan-coklat terang.

AKAR
Tunggang.

BUAH
Bentuk bulat sampai ellipsoid, panjang 5 – 6 cm, lebar 4 – 5 cm, kulit buah tipis, warna hijau terang dengan bintik-bintik berwarna gelap, kehitaman jika masak, daging buah oranye gelap, biji batu dengan dinding yang tebal.

BUNGA
Bunga majemuk berkelamin ganda, bentuk bunga rasemos, panjang tangkai bunga ± 28 cm, panjang anak tangkai bunga yaitu 2 – 4 mm, daun kelopak bulat telur memanjang dengan panjang 2 – 3 mm, daun mahkota bulat telur memanjang, benang sari sama panjang dengan mahkota, staminodia sangat pendek.

NAMA LOKAL
Kasturi.

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS LAMBUNG MANGKURAT
LABORATORIUM FMIPA
Alamat: Jl. Jend A. Yani Km. 35.8BanjarbaruTelp/Fax (0511) 4772826, website www.labdasar-unlam.org

SERTIFIKAT HASIL UJI
Nomor: 185/LB.LABDASAR/XI/2020

KLASIFIKASI

Kingdom	:	Plantae
Divisi	:	Magnoliophyta
kelas	:	Magnoliopsida
Ordo	:	Sapindales
Family	:	Anacardiaceae
Genus	:	*Mangifera*
Species	:	*Mangifera casturi* Kosterm.

Banjarbaru, 19 November 2020
Manager Puncak,

Dr. Fotok Wianto,S.Si.,M.Si.
NIP.19780504 200312 1 004

Lampiran 3. Dokumentasi Pembuatan Simplisia Daun kasturi (*Mangifera casturi kosterm.*)

No	Proses	Dokumentasi	No	Proses	Dokumentasi
1	Pengumpulan		5	Pengeringan	
2	Sortasi Basah		6	Sortasi Kering	
3	Pencucian		7	Penyerbukan	
4	Perajangan		8	Pengayakan	

Lampiran 4. Dokumentasi Pembuatan Ekstrak Etanol Daun Kasturi (*Mangifera casturi kosterm)*

No	Proses	Dokumentasi	No	Proses	Dokumentasi
1	Maserasi		4	Penguapan	
2	Penyaringan		5	Ekstrak Daun Kasturi	
3	Pemekatan				

Lampiran 5. Perhitungan Rendemen Simplisia dan Ekstrak Etanol 96% Daun Kasturi (*Mangiefera casturi* Kosterm.)

a. Rendemen Simplisia Etanol 96% Daun Kasturi (*Mangifera caturi* Kosterm.)

$$\text{Rendemen} = \frac{\text{Bobot Serbuk Simplisia}}{\text{Bobot Daun kasturi Segar}} \times 100\%$$

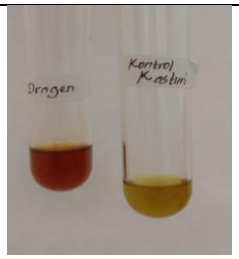
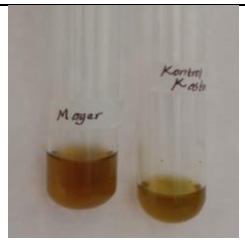
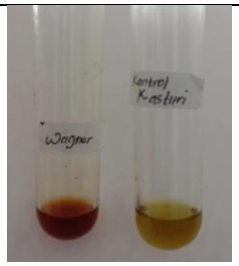
$$\text{Rendemen} = \frac{5\ \text{Kg}}{14\ \text{Kg}} \times 100\% = 35{,}71\%$$

b. Rendemen Ekstrak Etanol 96% Daun Kasturi (*Mangifera caturi* Kosterm.)

$$\text{Rendemen} = \frac{\text{Bobot Ekstrak}}{\text{Bobot Simplisia}} \times 100\%$$

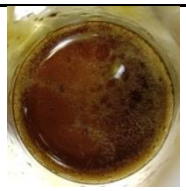
$$\text{Rendemen} = \frac{211{,}35\ \text{gram}}{5000\ \text{gram}} \times 100\% = 4{,}27\%$$

Lampiran 6. Hasil Skrining Fitokimia Ekstrak Etanol 96% Daun Kasturi (*Mangifera caturi* Kosterm.)

Jenis Uji	Pereaksi	Hasil	Keterangan	Dokumentasi
Alkaloid	Dragendoff	(-)	Tidak terbentuk endapan jingga	
	Mayer	(-)	Tidak terbentuk endapan putih-kekuningan	
	Wagner	(-)	Tidak terbentuk endapan cokelat-kemerahan	

Flavonoid	Serbuk Mg + HCl pekat + Amil Alkohol	(+)	Terbentuk warna jingga pada lapisan amil alkohol	
Fenol	$FeCl_3$ 3%	(+)	Terbentuk warna hitam	
Saponin	Aquadest + HCl 2N	(-)	Tidak terbentuknya busa	
Steroid	Pereaksi Lieberman-Buchard	(+)	Terbentuk warna hijau	
Tanin	Aquadest + Gelatin 1% dalam NaCl	(-)	Tidak terbentuk endapan putih	

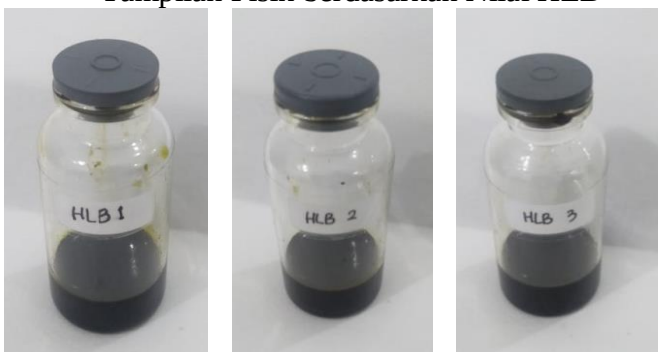
Lampiran 7. Dokumentasi Optimasi Pembawa

Bahan Pembawa	Perbandingan	Dokumentasi
***Virgin Coconut Oil* (VCO)**	1:13	
Capryol 90	1:7	
Tween 80	1:5	
Tween 20	1:20	
PEG 400	1:4	
Propilenglikol	1:4	

Keterangan :
* perbandingan ekstrak dengan komponen yang ditambahkan (b/b)

Lampiran 8. Dokumentasi Optimasi Nilai *Hydrophillic Lypophillic Balance* (HLB)

Tampilan Fisik berdasarkan Nilai HLB



a b c

Keterangan :
a. Formula dengan nilai HLB 13,5
b. Formula dengan nilai HLB 14
c. Formula dengan nilai HLB 14,5

Hasil Perhitungan *Hydrophilic Lipophilic Balance* (HLB)

a. HLB 13,5

% Tween 80 $= \frac{13,5-13,1}{15-13,1} \times 70\% = \frac{0,4}{1,9} \times 70\% = 15\%$

Jumlah Tween 80 yang diambil = $\frac{15}{100} \times 15$ gram = 2,25 gram

% PEG 400 = 70% - 15% = 55%

Jumlah PEG 400 yang diambil = $\frac{55}{100} \times 15$ gram = 8,25 gram

b. HLB 14

% Tween 80 $= \frac{14-13,1}{15-13,1} \times 70\% = \frac{0,9}{1,9} \times 70\% = 33\%$

Jumlah Tween 80 yang diambil = $\frac{33}{100} \times 15$ gram = 4,95 gram

% PEG 400 = 70% - 33% = 37%

Jumlah PEG 400 yang diambil = $\frac{37}{100} \times 15$ gram = 5,55 gram

c. HLB 14,5

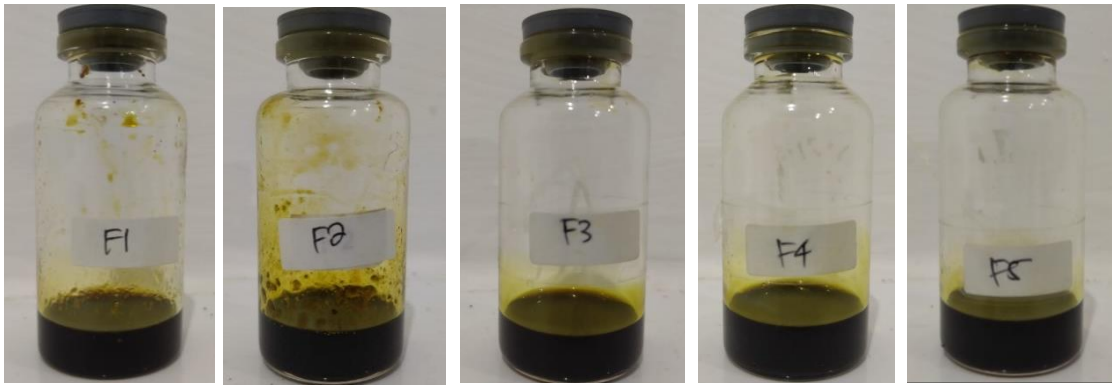
% Tween 80 $= \frac{14,5-13,1}{15-13,1} \times 70\% = \frac{1,4}{1,9} \times 70\% = 52\%$

Jumlah Tween 80 yang diambil = $\frac{52}{100} \times 15$ gram = 7,8 gram

% PEG 400 = 70% - 52% = 18%

Jumlah PEG 400 yang diambil = $\frac{18}{100} \times 15$ gram = 2,7 gram

Lampiran 9. Dokumentasi Pengujian Organoleptis Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)



F1 F2 F3 F4 F5

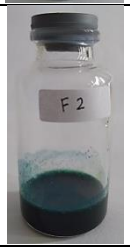
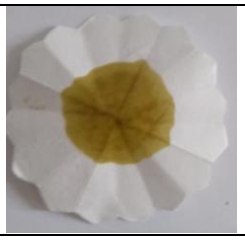
Keterangan :
F1: Perbandingan konsentrasi Tween 80 : PEG 400 (70 : 0)
F2: Perbandingan konsentrasi Tween 80 : PEG 400 (0 : 70)
F3: Perbandingan konsentrasi Tween 80 : PEG 400 (35 : 35)
F4: Perbandingan konsentrasi Tween 80 : PEG 400 (17,5 : 52,5)
F5: Perbandingan konsentrasi Tween 80 : PEG 400 (52,5 : 17,5)

Lampiran 10. Hasil Pengujian pH Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

Formula	**Replikasi**			**Rata-rata**
	1	2	3	
F1	6,92	6,98	7,02	6,97
F2	6,73	6,82	6,87	6,8
F3	6,72	6,77	6,82	6,77
F4	6,89	6,90	6,92	6,9
F5	7,15	7,02	7,01	7,06

Lampiran 11. Hasil Pengujian Tipe Nanoemulsi Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

Formula	**Dokumentasi**			
	Pengenceran	Kertas Saring	Pewarnaan	Konduktivitas

F1				
F2				
F3				
F4				
F5				

Lampiran 12. Hasil Pengujian Viskositas Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

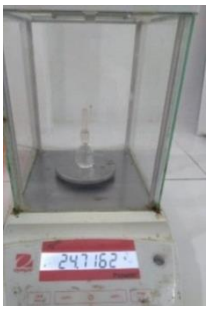
Formula	Replikasi (cPs)			Rata-rata
	1	2	3	
F1	322,5	321,5	323,5	322,5
F2	135	134	134	134
F3	207,5	207,0	206,5	207,0
F4	189,5	189,5	189,5	189,5
F5	264	264	264	264

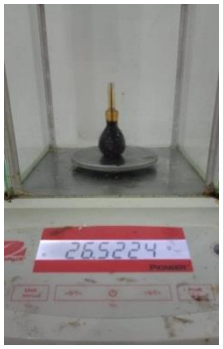
Lampiran 13. Dokumentasi dan Perhitungan Bobot Jenis Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

a. Data Bobot Jenis SNEDDS Daun Kasturi

Formula	Replikasi (gram/mL)			Rata-rata
	1	2	3	
F1	1,0868	1,0841	1,0828	1,0845
F2	1,1433	1,1454	1,1433	1,1440
F3	1,0944	1,0942	1,0946	1,0944
F4	1,1148	1,1147	1,1153	1,1149
F5	1,0826	1,0830	1,0825	1,0827

b. Dokumentasi Pengujian Bobot Jenis SNEDDS Daun Kasturi

Dokumentasi	Keterangan
	Bobot piknometer kosong (A gram)
	Piknometer + aquadest pada suhu 25ºC
	Bobot piknometer kosong + Aquadest (A1 gram)
	Perendaman piknometer + sediaan SNEDDS daun kasturi pada suhu 25ºC



Bobot piknometer kosong + sediaan
SNEDDS daun kasturi
(A2 gram)

---

c. Perhitungan Bobot Jenis SNEDDS Daun Kasturi

FORMULA 1

Replikasi 1

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 25,7953 gram (A2 gram)

Bobot jenis (gram/mL) $= \frac{A2-A}{A1-A} = \frac{25,7953 - 12,2969}{24,7162 - 12,2969}$

$= \frac{13,4984}{12,4193}$ =1,0868 gram/mL

Replikasi 2

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 25,7609 gram (A2 gram)

Bobot jenis (gram/mL) $= \frac{A2-A}{A1-A} = \frac{25,7609 - 12,2969}{24,7162 - 12,2969}$

$= \frac{13,4640}{12,4193}$ =1,0841 gram/mL

Replikasi 3

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 25,7451 gram (A2 gram)

Bobot jenis (gram/mL) $= \frac{A2-A}{A1-A} = \frac{25,7451 \ -12,2969}{24,7162 \ -12,2969}$

$= \frac{13,4482}{12,4193}$ =1,0828 gram/mL

FORMULA 2

Replikasi 1

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 26,4964 gram (A2 gram)

Bobot jenis (gram/mL) $= \frac{A2-A}{A1-A} = \frac{26,4964 \ -12,2969}{24,7162 \ -12,2969}$

$= \frac{14,1995}{12,4193}$ =1,1433 gram/mL

Replikasi 2

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 26,5224 gram (A2 gram)

Bobot jenis (gram/mL) $= \frac{A2-A}{A1-A} = \frac{26,5224 \ -12,2969}{24,7162 \ -12,2969}$

$= \frac{14,2255}{12,4193}$ =1,1454 gram/mL

Replikasi 3

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 26,4966 gram (A2 gram)

Bobot jenis (gram/mL) $= \frac{A2-A}{A1-A} = \frac{26,4966 \ -12,2969}{24,7162 \ -12,2969}$

$= \frac{14,1997}{12,4193}$ =1,1433 gram/mL

FORMULA 3

Replikasi 1

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 25,8839 gram (A2 gram)

$$\text{Bobot jenis (gram/mL)} = \frac{A2-A}{A1-A} = \frac{25,8839 - 12,2969}{24,7162 - 12,2969}$$

$$= \frac{13,5870}{12,4193} = 1,0944 \text{ gram/mL}$$

Replikasi 2

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 25,8862 gram (A2 gram)

$$\text{Bobot jenis (gram/mL)} = \frac{A2-A}{A1-A} = \frac{25,8862 - 12,2969}{24,7162 - 12,2969}$$

$$= \frac{13,5893}{12,4193} = 1,0942 \text{ gram/mL}$$

Replikasi 3

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 25,8922 gram (A2 gram)

$$\text{Bobot jenis (gram/mL)} = \frac{A2-A}{A1-A} = \frac{25,8922 - 12,2969}{24,7162 - 12,2969}$$

$$= \frac{13,5953}{12,4193} = 1,0946 \text{ gram/mL}$$

FORMULA 4

Replikasi 1

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 26,1424 gram (A2 gram)

$$\text{Bobot jenis (gram/mL)} = \frac{A2-A}{A1-A} = \frac{26,1424 - 12,2969}{24,7162 - 12,2969}$$

$$= \frac{13,8455}{12,4193} = 1,1148 \text{ gram/mL}$$

Replikasi 2

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 26,1410 gram (A2 gram)

$$\text{Bobot jenis (gram/mL)} = \frac{A2-A}{A1-A} = \frac{26,1410 - 12,2969}{24,7162 - 12,2969}$$

$$= \frac{13,8441}{12,4193} = 1,1147 \text{ gram/mL}$$

Replikasi 3

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 26,1485 gram (A2 gram)

$$\text{Bobot jenis (gram/mL)} = \frac{A2-A}{A1-A} = \frac{26,1485 - 12,2969}{24,7162 - 12,2969}$$

$$= \frac{13,8516}{12,4193} = 1,1153 \text{ gram/mL}$$

FORMULA 5

Replikasi 1

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 25,7428 gram (A2 gram)

$$\text{Bobot jenis (gram/mL)} = \frac{A2-A}{A1-A} = \frac{25,7428 - 12,2969}{24,7162 - 12,2969}$$

$$= \frac{13,4459}{12,4193} = 1,0826 \text{ gram/mL}$$

Replikasi 2

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 25,7477 gram (A2 gram)

$$\text{Bobot jenis (gram/mL)} = \frac{A2-A}{A1-A} = \frac{25,7477 - 12,2969}{24,7162 - 12,2969}$$

$$= \frac{13,4508}{12,4193} = 1,0830 \text{ gram/mL}$$

Replikasi 3

Bobot piknometer kosong : 12,2969 gram (A gram)

Bobot piknometer kosong + Aquadest : 24,7162 gram (A1 gram)

Bobot piknometer kosong + SNEDDS : 25,7415 gram (A2 gram)

$$\text{Bobot jenis (gram/mL)} = \frac{A2-A}{A1-A} = \frac{25,7415 - 12,2969}{24,7162 - 12,2969}$$

$$= \frac{13,4446}{12,4193} = 1,0825 \text{ gram/mL}$$

Lampiran 14. Hasil Pengujian Persen Transmittan Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

Formula	Replikasi (%)			Rata-rata
	1	2	3	
F1	84,5	86,1	83,0	84,5
F2	37,4	33,1	39,0	36,5
F3	77,2	72,7	74,6	74,8
F4	70,2	76,8	80,5	75,8
F5	86,4	86,1	84,2	85,5

Lampiran 15. Hasil Pengujian *Emulsification Time* Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

a. *Aquadest*

Formula	Replikasi (detik)			Rata-rata
	1	2	3	
F1	30	31	38	33
F2	09	06	05	7
F3	07	08	10	8
F4	11	10	10	10,3
F5	23	22	29	25

b. *Artificial Gastro Fluid* (AGF)

Formula	Replikasi (detik)			Rata-rata
	1	2	3	
F1	47	58	41	48,5
F2	5	5	5	5
F3	10	5	8	7,6
F4	6	6	6	6
F5	15	14	13	14

c. *Artificial Intestinal Fluid* (AIF)

Formula	Replikasi (detik)			Rata-rata
	1	2	3	
F1	39	43	34	38,6
F2	7	8	8	7,6
F3	7	12	10	9,6
F4	8	11	11	10
F5	24	28	31	27,6

Lampiran 16. Hasil Pengujian Ukuran Partikel Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

Formula	Replikasi (nm)			Rata-rata
	1	2	3	
F1	17,4	17,0	17,4	17,26
F2	186,4	187,6	184,8	186,26
F3	102,3	103,8	104,2	103,43
F4	166,7	165,0	167,7	165,8
F5	59,6	59,5	59,7	59,6

Lampiran 17. Hasil Pengujian Indeks Polidispersitas Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

Formula	Replikasi			Rata-rata
	1	2	3	
F1	0,297	0,370	0,345	0,337
F2	0,578	0,475	0,398	0,483
F3	0,303	0,314	0,303	0,306
F4	0,457	0,493	0,386	0,445
F5	0,539	0,521	0,505	0,521

Lampiran 18. Hasil Pengujian Zeta Potensial Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

Formula	Replikasi (mV)			Rata-rata
	1	2	3	
F1	-25,2	-25,6	-23	-24,6
F2	-57,2	-57,5	-56,2	-56,96
F3	-21,6	-21,8	-21,8	-21,73
F4	-22,7	-22,6	-22,6	-22,63
F5	-22,5	-22,4	-22,2	-22,36

Lampiran 19. Dokumentasi dan Perhitungan Pengujian *Drug Loading* Sediaan *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) Ekstrak Etanol 96% Daun Kasturi (*Mangifera casturi* Kosterm.)

a. Data Hasil Pengujian

- *% Drug Loading*

Formula	Replikasi (%)			Rata-rata
	1	2	3	
F1	10,30	10,30	10,30	10,30
F2	10,30	10,30	10,30	10,30
F3	10,30	10,30	10,30	10,30
F4	10,30	10,30	10,30	10,30
F5	10,30	10,30	10,26	10,30

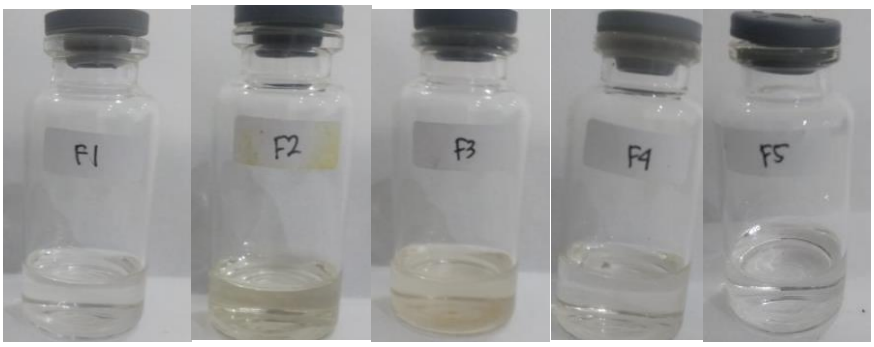
- *% Entropment Eficiency*

Formula	Replikasi (%)			Rata-rata
	1	2	3	
F1	99,94	99,93	99,93	99,93
F2	99,94	99,91	99,90	99,91
F3	99,92	99,93	99,92	99,92
F4	99,88	99,90	99,90	99,89
F5	99,94	99,93	99,94	99,93

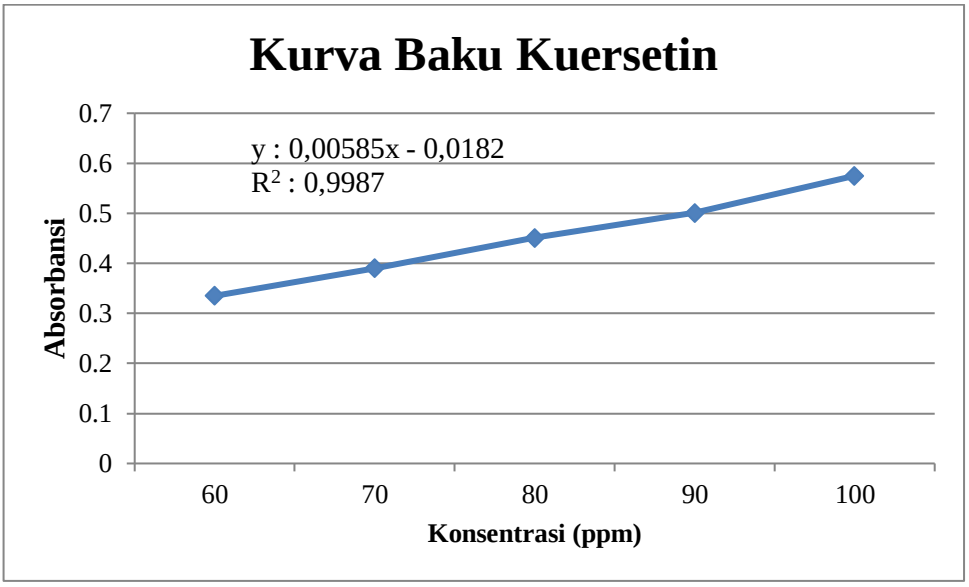
b. Dokumentasi Pengujian *Drug Loading*

(1)

(2)



(3)



(4)

Keterangan :
1. Larutan Induk Kuersetim
2. Larutan Seri Kurva Baku Kuersetin
3. Larutan Sampel Sediaan SNEDDS Ekstrak Etanol 96% Daun Kasturi
4. Grafik Kurva Baku Kuersetin

c. Perhitungan *Drug Loading*

(1) Pembuatan Larutan Induk Kuersetin 1000 ppm

Rumus :

$$ppm = \frac{mg}{L}$$

$$1000\ ppm = \frac{1000\ mg}{L}$$

1000 ppm = 10 mg dalam 10 mL

(2) Pengenceran Larutan Kuersetin

Rumus : $M_1 \times V_1 = M_2 \times V_2$

Keterangan :

M_1 : Konsentrasi larutan yang diencerkan
M_2 : Konsentrasi larutan pengenceran
V_1 : Volume larutan standar yang diencerkan
V_2 : Volume larutan pengenceran

1. Pengenceran 60 ppm dalam 10 mL

   Diketahui : M_1 : 1000 ppm
   M_2 : 60 ppm
   V_2 : 10 mL
   Ditanya: V_1 ?
   1000 ppm x V_1 = 10 ppm x 10 mL
   $V_1 = \frac{60 \text{ ppm} \times 10 \text{ mL}}{1000 \text{ ppm}} = 0{,}6$ mL

2. Pengenceran 70 ppm dalam 10 mL

   Diketahui : M_1 : 1000 ppm
   M_2 : 70 ppm
   V_2 : 10 mL
   Ditanya: V_1 ?
   1000 ppm x V_1 = 70 ppm x 10 mL
   $V_1 = \frac{70 \text{ ppm} \times 10 \text{ mL}}{1000 \text{ ppm}} = 0{,}7$ mL

3. Pengenceran 80 ppm dalam 10 mL

   Diketahui : M_1 : 1000 ppm
   M_2 : 80 ppm
   V_2 : 10 mL
   Ditanya: V_1 ?
   1000 ppm x V_1 = 80 ppm x 10 mL
   $V_1 = \frac{80 \text{ ppm} \times 10 \text{ mL}}{1000 \text{ ppm}} = 0{,}8$ mL

4. Pengenceran 90 ppm dalam 10 mL

   Diketahui : M_1 : 1000 ppm
   M_2 : 90 ppm
   V_2 : 10 mL
   Ditanya: V1 ?
   1000 ppm x V_1 = 90 ppm x 10 mL
   $V_1 = \frac{90 \text{ ppm} \times 10 \text{ mL}}{1000 \text{ ppm}} = 0{,}9$ mL

5. Pengenceran 100 ppm dalam 10 mL

Diketahui : M_1 : 1000 ppm
M_2 : 100 ppm
V_2 : 10 mL

Ditanya: V_1 ?

1000 ppm x V_1 = 100 ppm x 10 mL

$V_1 = \frac{100 \text{ ppm} \times 10 \text{ mL}}{1000 \text{ ppm}} = 1{,}0 \text{ mL}$

(3) Pembuatan Larutan Sampel SNEDDS ekstrak etanol 96% daun kasturi

$\text{ppm} = \frac{\text{mg}}{\text{L}}$

$1000 \text{ ppm} = \frac{1000 \text{ mg}}{\text{L}}$

1000 ppm = 10 mg dalam 10 mL

(4) Pembuatan Reagen

1. Reagen $AlCl_3$ 10% dalam 10 mL aquadest
$\frac{10 \text{ gram}}{100 \text{ mL}} \times \frac{X}{10 \text{ mL}} = 1 \text{ gram}$

2. Asam asetat 5% dalam 100 mL aquadest
$\frac{5}{100} \times 100 \text{ mL} = 5 \text{ mL}$

(5) Perhitungan % *Drug Loading* dan % *Entropment Eficiency* SNEDDS

Ekstrak Etanol 96% Daun Kasturi

1. Perhitungan Kadar Flavonoid Dalam Ekstrak (Jumlah Obat Awal)

Diketahui :

Persamaan regresi linier	: y = 0,00586 x - 0,0182
Absorbansi sampel	: 0,611; 0,558; 0,813
Bobot sampel	: 10 mg = 0,010 gram
Konsentrasi	: 1000 ppm

Rumus : $\frac{C \times M}{V}$

Keterangan :
C : Konsentrasi Absorbansi
M : Konsentrasi yang diambil (Bobot sampel)
V : Volume yang dibuat

a. Absorbansi 0,611

y = 0,00586 x – 0,0182

0,611 = 0,00586 x – 0,0182

0,00586 x = 0,611 + 0,0182

$X = \frac{0,289 + 0,0182}{0,00585} = 107,55$ ppm = 107,55 mg/L

Kandungan Flavonoid Total $= \frac{C \times V}{M}$

$= \frac{107,55 \text{ mg/L} \times 0,01 \text{ L}}{0,01 \text{ g}}$

= 107,55 mg QE/g ekstrak

b. Absorbansi 0,558

y = 0,00586 x – 0,0182

0,558 = 0,00586 x – 0,0182

0,00586 x = 0,558 + 0,0182

$X = \frac{0,558 + 0,0182}{0,00585} = 98,49$ ppm = 98,49 mg/L

Kandungan Flavonoid Total $= \frac{C \times V}{M}$

$= \frac{94,49 \text{ mg/L} \times 0,01 \text{ L}}{0,01 \text{ g}}$

= 98,49 mg QE/g ekstrak

c. Absorbansi 0,813

y = 0,00586 x – 0,0182

0,813 = 0,00586 x – 0,0182

0,00586 x = 0,813 + 0,0182

$X = \frac{0,813 + 0,0182}{0,00585} = 142,08$ ppm = 142,08 mg/L

Kandungan Flavonoid Total $= \frac{C \times V}{M}$

$= \frac{142{,}08 \text{ mg/L} \times 0{,}01 \text{ L}}{0{,}01 \text{ g}}$

= 142,08 mg QE/g ekstrak

Sampel	Absorbansi	(mg QE/g ekstrak)	(mg QE/g ekstrak)
Ekstrak	0,611	107,55	116,04
	0,558	98,49	
	0,813	142,08	

15 gram sediaan SNEDDS menggunakan sebanyak 1,6 gram Ekstrak Etanol Daun Kasturi

Jadi, 1 gram ekstrak = 116,04 mg QE untuk 1,6 gram = 185,664 mg QE

Jumlah obat awal = 185,664 mg

2. Perhitungan % *Drug Loading* dan % *Entropment Efficiency*

Rumus :

% *Drug Loading* = $\frac{\text{(Jumlah obat awal – jumlah obat bebas)}}{\text{Jumlah minyak (Lipid) dalam sediaan}} \times 100\%$

% Entropment Efficiency = $\frac{\text{(Jumlah obat awal – jumlah obat bebas)}}{\text{Jumlah obat awal}} \times 100\%$

Keterangan :

Jumlah obat awal : Hasil perhitungan kadar flavonoid dalam ekstrak

Jumlah obat bebas : Hasil perhitungan Absorbansi tiap formula

Jumlah minyak (Lipid) dalam sediaan : Capryol 12 % (% b/v)

$= \frac{12 \text{ gram}}{100 \text{ mL}} \times 15 \text{ mL}$

= 1,8 gram = 1.800 mg

- **Formula 1**

Replikasi 1 Absorbansi 0,108

$X = \frac{0,108 + 0,0182}{0,00585} = 21,5726$ ppm = 21,5726 µg/mL x 5 (Faktor Pengenceran)

X = 107,86 µg = 0,1078 mg (Jumlah obat bebas)

% *Drug Loading* = $\frac{(185,664 \text{ mg} - 0,1078 \text{ mg})}{1.800 \text{ mg}} \times 100\% = 10,30\%$

% Entropment Efficiency = $\frac{(185,664 \text{ mg} - 0,1078 \text{ mg})}{185,664} \times 100\% = 99,94\%$

Replikasi 2 Absorbansi 0,129

$X = \frac{0,129 + 0,0182}{0,00585} = 25,1623$ ppm = 25,1623 µg/mL x 5

X = 125,81 µg (Jumlah Obat Bebas)

% *Drug Loading* = $\frac{(185,664 \text{ mg} - 0,1258 \text{ mg})}{1.800 \text{ mg}} \times 100\% = 10,30\%$

% Entropment Efficiency = $\frac{(185,664 \text{ mg} - 0,1258 \text{ mg})}{185,664} \times 100\% = 99,93\%$

Replikasi 3 Absorbansi 0,113

$X = \frac{0,113 + 0,0182}{0,00585} = 22,4273$ ppm = 22,4273 µg/mL x 5

X = 112,13 µg (Jumlah Obat Bebas)

% *Drug Loading* = $\frac{(185,664 \text{ mg} - 0,1121 \text{ mg})}{1.800 \text{ mg}} \times 100\% = 10,30\%$

% Entropment Efficiency = $\frac{(185,664 \text{ mg} - 0,1121 \text{ mg})}{185,664} \times 100\% = 99,93\%$

- **Formula 2**

  Replikasi 1 Absorbansi 0,109

  $X = \frac{0,109 + 0,0182}{0,00585} = 21,7435 \text{ ppm} = 21,7435 \text{ µg/mL} \times 5$

  X = 108,71 µg (Jumlah Obat Bebas)

  % *Drug Loading* = $\frac{(185,664 \text{ mg} - 0,1087 \text{ mg})}{1.800 \text{ mg}} \times 100\% = 10,30\%$

  % Entropment Efficiency = $\frac{(185,664 \text{ mg} - 0,1087 \text{ mg})}{185,664} \times 100\% = 99,94\%$

  Replikasi 2 Absorbansi 0,160

  $X = \frac{0,160 + 0,0182}{0,00585} = 30,4615 \text{ ppm} = 30,4615 \text{ µg/mL} \times 5$

  X = 152,30 µg (Jumlah Obat Bebas)

  % *Drug Loading* = $\frac{(185,664 \text{ mg} - 0,1523 \text{ mg})}{1.800 \text{ mg}} \times 100\% = 10,30\%$

  % Entropment Efficiency = $\frac{(185,664 \text{ mg} - 0,1523 \text{ mg})}{185,664} \times 100\% = 99,91\%$

  Replikasi 3 Absorbansi 0,180

  $X = \frac{0,180 + 0,0182}{0,00585} = 33,8803 \text{ ppm} = 33,8803 \text{ µg/mL} \times 5$

  X = 169,40 µg (Jumlah Obat Bebas)

  % *Drug Loading* = $\frac{(185,664 \text{ mg} - 0,1694 \text{ mg})}{1.800 \text{ mg}} \times 100\% = 10,30\%$

  % Entropment Efficiency = $\frac{(185,664 \text{ mg} - 0,1694 \text{ mg})}{185,664} \times 100\% = 99,90\%$

- **Formula 3**

  Replikasi 1 Absorbansi 0,168

  $X = \frac{0,168 + 0,0182}{0,00585} = 31,8290 \text{ ppm} = 31,8290 \text{ µg/mL} \times 5$

X = 159,145 µg (Jumlah Obat Bebas)

% *Drug Loading* = $\frac{(185{,}664\ mg - 0{,}1591\ mg)}{1.800\ mg} \times 100\% = 10{,}30\%$

% Entropment Efficiency = $\frac{(185{,}664\ mg - 0{,}1591\ mg)}{185{,}664} \times 100\% = 99{,}91\%$

Replikasi 2 Absorbansi 0,117

X = $\frac{0{,}117 + 0{,}0182}{0{,}00585}$ = 23,1111 ppm = 23,1111 µg/mL x 5

X = 115,55 µg (Jumlah Obat Bebas)

% *Drug Loading* = $\frac{(185{,}664\ mg - 0{,}1155\ mg)}{1.800\ mg} \times 100\% = 10{,}30\%$

% Entropment Efficiency = $\frac{(185{,}664\ mg - 0{,}1155\ mg)}{185{,}664} \times 100\% = 99{,}93\%$

Replikasi 3 Absorbansi 0,139

X = $\frac{0{,}139 + 0{,}0182}{0{,}00585}$ = 26,8717 ppm = 26,8717 µg/mL x 5

X = 134,35 µg (Jumlah Obat Bebas)

% *Drug Loading* = $\frac{(185{,}664\ mg - 0{,}1343\ mg)}{1.800\ mg} \times 100\% = 10{,}30\%$

% Entropment Efficiency = $\frac{(185{,}664\ mg - 0{,}1343\ mg)}{185{,}664} \times 100\% = 99{,}92\%$

- **Formula 4**

Replikasi 1 Absorbansi 0,239

X = $\frac{0{,}239 + 0{,}0182}{0{,}00585}$ = 43,9658 ppm = 43,9658 µg/mL x 5

X = 219,82 µg (Jumlah Obat Bebas)

% *Drug Loading* = $\frac{(185{,}664\ mg - 0{,}2198\ mg)}{1.800\ mg} \times 100\% = 10{,}30\%$

% Entropment Efficiency =(185,664 mg – 0,2198 mg) x 100% = 99,88%
185,664

Replikasi 2 Absorbansi 0,190

X = 0,190 + 0,0182 = 35,5897 ppm = 35,5897 µg/mL x 5
0,00585

X = 177,94 µg (Jumlah Obat Bebas)

% *Drug Loading* = (185,664 mg – 0,1779 mg) x 100% = 10,30%
1.800 mg

% Entropment Efficiency =(185,664 mg – 0,1779 mg) x 100% = 99,90%
185,664

Replikasi 3 Absorbansi 0,187

X = 0,187 + 0,0182 = 35,0769 ppm = 35,0769 µg/mL x 5
0,00585

X = 175,38 µg (Jumlah Obat Bebas)

% *Drug Loading* = (185,664 mg – 0,1753 mg) x 100% = 10,30%
1.800 mg

% Entropment Efficiency =(185,664 mg – 0,1753 mg) x 100% = 99,90%
185,664

- **Formula 5**

Replikasi 1 Absorbansi 0,107

X = 0,107 + 0,0182 = 21,4017 ppm = 21,4017 µg/mL x 5
0,00585

X = 107,00 µg (Jumlah Obat Bebas)

% *Drug Loading* = (185,664 mg – 0,1070 mg) x 100% = 10,30%
1.800 mg

% Entropment Efficiency =(185,664 mg – 0,1070 mg) x 100% = 99,94%
185,664

Replikasi 2 Absorbansi 0,123

$$X = \frac{0,123 + 0,0182}{0,00585} = 24,1367 \text{ ppm} = 24,1367 \text{ µg/mL} \times 5$$

X = 120,68 µg (Jumlah Obat Bebas)

$$\%\ \textit{Drug Loading} = \frac{(185,664 \text{ mg} - 0,1206 \text{ mg})}{1.800 \text{ mg}} \times 100\% = 10,30\%$$

$$\%\ \text{Entropment Efficiency} = \frac{(185,664 \text{ mg} - 0,1206 \text{ mg})}{185,664} \times 100\% = 99,93\%$$

Replikasi 3 Absorbansi 0,091

$$X = \frac{0,091 + 0,0182}{0,00585} = 18,6666 \text{ ppm} = 18,6666 \text{ µg/mL} \times 5$$

X = 93,33 µg (Jumlah Obat Bebas)

$$\%\ \textit{Drug Loading} = \frac{(185,664 \text{ mg} - 0,0933 \text{ mg})}{1.800 \text{ mg}} \times 100\% = 10,30\%$$

$$\%\ \text{Entropment Efficiency} = \frac{(185,664 \text{ mg} - 0,0933 \text{ mg})}{185,664} \times 100\% = 99,94\%$$