DAFTAR PUSTAKA

Ahmad, N. 2023. In Vitro and In Vivo Characterization Methods for Evaluation of Modern Wound Dressings. *Pharmaceutics*, *15*(42), 1–47.

Alven, S., Peter, S., Mbese, Z., & Aderibigbe, B. A. 2022. Polymer-Based Wound Dressing Materials Loaded with Bioactive Agents : Potential Materials for the Treatment of Diabetic Wounds. *Polymers*, *14*, 1–35.

Antlej, K. 2014. *Preparation and Characterization of Nitrosothiols as Nitric Oxide Donors.* Master Thesis: Faculty of Pharmacy, Ljubljana University.

Ardana, M., Aeyni, V., & Ibrahim, A. 2015. Formulasi dan Optimasi Basis Gel HPMC (Hydroxy Propyl Methyl Cellulose) dengan Berbagai Variasi Konsentrasi. *Journal of Tropical Pharmacy and Chemistry, 2*(3), 101-108.

Astrini, N., Anah, L., & Haryono, A. 2016. Pengaruh Metilen Bisakrilamid (MBA) Pada Pembuatan Superabsorben Hidrogel Berbasis Selulosa Terhadap Sifat Penyerapan Air. *Jurnal Kimia Kemasan, 1*(38), 15-20.

Balakrishnan, B., Mohanty, M., Umashankar, P.R., Jayakrishnan, A. 2005. Evaluation of an in situ forming hydrogel wound dressing based on oxidized alginate and gelatin. *Biomaterials*, *26*, 6335–6342.

Bang, C. S., Kinnunen, A., Karlsson, M., Önnberg, A., Söderquist, B., & Persson, K. 2014. The Antibacterial Effect of Nitric Oxide Against ESBL-Producing Uropathogenic E. Coli is Improved by Combination with Miconazole and Polymyxin B Nonapeptide. *BMC Microbiology*, *14*(1), 1–9.

Boateng, J. 2020. *Therapeutic Dressing and Wound Healing Applications*. Malaysia: John Wiley & Sons Ltd.

Borodulin, R. R., Kubrina, L. N., Shvydkiy, V. O., Lakomkin, V. L., & Vanin, A. F. 2013. A Simple Protocol for The Synthesis of Dinitrosyl Iron Complexes with Glutathione: EPR, Optical, Chromatographic and Biological Characterization of Reaction Products. *Nitric Oxide - Biology and Chemistry*, *35*, 110–115.

Broniowska, K. A., Diers, A. R., and Hogg, N. 2013. S-Nitrosoglutathione. *Biochim Biophys Acta*. *1830*(5), 3173-3181.

Chamkouri, H., & Chamkouri, M. 2021. A Review of Hydrogels, Their Properties and Applications in Medicine. *American Journal of Biomedical Science & Research, 11*(6), 485-493.

Ciolacu, D. E., Nicu, R., & Ciolacu, F. 2020. Cellulose-Based Hydrogels as Sustained Drug-Delivery Systems. *Materials, 13,* 1-37.

Dachriyanus. 2004. *Aplikasi Struktur Senyawa Organik Secara Spektroskopi*. Padang: LPTIK Universitas Andalas.

Das, S., De, A., Das, B., Mukherjee, B., & Samanta, A. 2020. Development of Gum Odina-Gelatin Based Antimicrobial Loaded Biodegradable Spongy Scaffold: A Promising Wound Care Tool. *Journal of Applied Polymer Science,* 1-17.

Depkes RI. 2020. *Farmakope Indonesia edisi VI*. Jakarta: Kementerian Kesehatan Republik Indonesia.

Dhivya, S., Padma, V. V., & Santhini, E. 2015. Wound Dressings – a review. *BioMedicine*, *5*(4), 24–28.

Gariépy, R. E., & Leroux, J. C., 2004. In situ-forming hydrogels – Review of temperature-sensitive systems. *Eur. J. Pharm. Biopharm,* 58, 409–426.

Ghomi, E. R., Khalili, S., Khorasani, S. N., Neisiany, R. E., & Ramakrishna, S. 2019. Wound Dressings : Current Advances and Future Directions. *Journal of Applied Polymer Science*, *136*, 1–12.

Gowda, D. V., Fredric, S., Srivastava, A., & Osmani, R. A. 2016. Design and development of antimicrobial wafers for chronic wound healing. *Pharm. Lett*., 8, 70–79.

Hajhashemi, H., Taymouri, S., & Shafiee, F. 2023. Development and evaluation of wafer loaded with sertaconazole solid dispersion for the treatment of oral candidiasis. *Brazilian Journal of Pharmaceutical Sciences*, *59*, 1–18.

Hall, J. R., Rouillard, K. R., Suchyta, D. J., Brown, M. D., Ahonen, M. J. R., & Schoen, M. H. 2020. Mode of Nitric Oxide Delivery Affects Antibacterial Action. *ACS Biomaterials Science & Engineering*, *6*, 433–441.

Harliatika, Y., & Noval. 2021. Formulasi dan Evaluasi Hidrogel Ekstrak Etanol Daun Gaharu (*Aquilaria malacensis* Lamk.) dengan Kombinasi

Basis Karbopol 940 dan HPMC K4M. *Journal of Pharmacy and Science, 1*(6), 37-46.

Hasan, N., Cao, J., Choi, M., Kim, I., Lee, B. L., Jung, Y., & Yoo, J. W. 2015. Nitric Oxide-Releasing Poly(lactic-co-glycolic acid)-polyethylenimine Nanoparticles for Prolonged Nitric Oxide Release, Antibacterial Efficacy, and in vivo Wound Healing Activity. *International Journal of Nanomedicine, 10,* 3065-3080.

Holden, J. K., Li, H., Jing, Q., Kang, S., Richo, J., Silverman, R. B., & Poulos, T. L. 2013. Structural and Biological Studies on Bacterial Nitric Oxide Synthase Inhibitors. *Proceedings of the National Academy of Sciences of the United States of America*, *45*(110), 18127–18131.

Hossain, M. S., Ahamed, P., Maniruzzaman, M., & Abu Yousuf, M. 2018. Preparation of Novel Hydrogel Composites with Enhanced Properties for Environment, Medical and Engineering Applications. *Journal of Science and Technology, 2*(1), 39-48.

Hurlow, J., & Bowler, P. G. 2022. Acute and chronic wound infections: microbiological, immunological, clinical and therapeutic distinctions. *Journal of Wound Care*, *31*(5), 436–445.

Jafari, H., Ramezani, V., & Nabi-meibodi, M. 2021. Development of Novel Adhesive Bilayer Lyophilized Wafer of Moxifloxacin as a Modern Wound Dressing. *Iranian Journal of Pharmaceutical Research*, *20*(3), 271–284.

Kong, Y., Tang, X., Zhao, Y., Chen, X., Yao, K., Zhang, L., & Han, Q. 2020. Degradable Tough Chitosan Dressing for Skin Wound Recovery. *Nanotechnology Reviews*, *9*, 1576–1585.

Kurniasih, M., KartiKa, D., & Riyanti. 2012. Sintesis dan Karakteristik Karboksimetil Kitosan. *Prosiding Seminar Nasional Pengembangan Sumber Daya Pedesaan dan Kearifan Lokal Berkelanjutan II*, *1*(3), 126.

Lee, J., Hlaing, S. P., Cao, J., Hasan, N., Ahn, H. J., Song, K. W., & Yoo, J. W. 2019. In Situ Hydrogel-Forming/Nitric Oxide-Releasing Wound Dressing for Enhanced Antibacterial Activity and Healing in Mice with Infected Wounds. *Pharmaceutics*, *11*(10), 1–18.

Lee, J., Kwak, D., Kim, H., Hlaing, P. S., Hasan, N., Cao,J., & Yoo. W. J. 2020. Nitric Oxide-Releasing S-Nitrosoglutathione Conjugated Poly (Lactic-Co-Glycolic Acid) Nanoparticles for the Treatment of MRSA-Infected Cutaneous Wounds. *Pharmaceutics*. *12*, 1-14

Li, W., Wang, D., Lao, K. U., & Wang, X. 2022. Inclusion Complexation of S-Nitrosoglutathione for Sustained NO Release and Reduced Device Infection. *Cold Spring Harbor Laboratory*, 1–20.

Liang, H., Nacharaju, P., Friedman, A., & Friedman, J. M. 2015. Nitric Oxide Generating/Releasing Materials. *Future Science, 1*(1), 2-10.

Lutfi, M., Sumarlan, S. H., Susilo, B., Wignyanto., Zenata, R., & Perdana, L. P. R. 2017. The Glycerol Effect on Mechanical Behaviour of Biodegradable Plastic from the Walur (Amorphophallus paenifolius Var. sylvestris). *Nature Environment and Pollution Technology*, *16*(4), 1121–1124.

Melvin, A. C., Jones, W. M., Lutzke, A., Allison, C. L., & Reynolds, M. M. 2019. S-Nitrosoglutathione Exhibits Greater Stability than S-nitroso-N-acetylpenicillamine Under Common Laboratory Conditions: A Comparative Stability Study. *Nitric Oxide,* 18-25.

Mentari, A. V., Handika, G., & Maulina, S. 2018. The Comparison of Function Group and Surface Morphology of Activated Carbon from Oil Palm Frond Using Phosporic Acid (H3PO4). *Jurnal Teknik Kimia USU*, *7*(1), 16–20.

Ming, H., Zhang, K., Ge, S., Shi, Y., Du, C., Guo, X., & Zhang, L. 2023. A Mini Review of S -Nitrosoglutathione Loaded Nano / Micro-Formulation Strategies. *nanomaterials*, *13*(224), 1–17.

Nguyen, H. M., Le, T. T. N., Nguyen, A. T., Le, H. N. T., & Pham, T. T. 2023. Biomedical Materials for Wound Dressing: Recent Advances and Applications. *Royal Society of Chemistry*, *13*, 5509-5528.

Noval., Rosyifa., & Annisa. 2020. Effect of HPMC Concentration Variation as Gelling Agent on Physical Stability of Formulation Gel Ethanol Extract Bundung Plants (Actinuscirpus Grossus). *NS-UNISM*, 1–15.

Nugrahaeni, F., Nining., & Okvianida, R. 2022. The Effect of HPMC Concentration as a Gelling Agent on Color Stability of Copigmented Blush Gel Extract of Purple Sweet (Ipomoea Batatas (L.) Lam.). *IOP Conference Series: Earth and Environmental Science*, *1041*(1).

Nursal, F.K., Nining., & Rahmani, A. 2021. Effect of Glycerin as Plasticizer in Formulation of Grape Seed Oil (Vitis vinifera L.) Emulgel Peel-Off Mask. *IOP Conference Series: Earth and Environmental Science*, *819*(1), 1–6.

Nyquist, R. 2001. *Interpreting Infrared, Raman and Nuclear Magnetic Resonance Spectra Volume 2*. Academic Press.

Ogunfowokan, A. A., Adereti, C. S., Daramola, L. S., & Famakinwa, T. T. 2016. Clinical Nurse's Knowledge and Perception of Modern Wound Dressing in a Teaching Hospital in Nigeria. *Africa Journal of Nursing and Midwifery*. *18*(1), 117-129.

Parent, M., Dahboul, F., Schneider, R., Clarot, I., Maincent, P., Leroy, P., & Boudier, A. 2013. A Complete Physicochemical Identity Card of S-nitrosoglutathione. *Current Pharmaceutical Analysis*, *9*(1), 31–42.

Pelegrino, M. T., de Araújo, D. R., & Seabra, A. B. 2017. S-nitrosoglutathione-Containing Chitosan Nanoparticles Dispersed in Pluronic F-127 Hydrogel: Potential Uses in Topical Applications. *Journal of Drug Delivery Science and Technology*, 1–35.

Pelegrino, M. T., Paganotti, A., Seabra, A. B., & Weller, R. B. 2020. Photochemistry of Nitric Oxide and S-nitrosothiols in Human Skin. *Histochemistry and Cell Biology*, *153*(6), 431–441.

Pieretti, J. C., Pelegrino, M. T., Boudier, A., & Seabra, A. B. 2021. Recent Progress in The Toxicity of Nitric Oxide-Releasing Nanomaterials. *Materials Advance, 2,* 7530-7542.

Poh, W.H., & Rice, S.A. 2022. Recent Developments in Nitric Oxide Donors and Delivery for Antimicrobial and Anti-Biofilm Applications. *Molecules*, *27*(3), 1–38.

Puca, V., Marulli, R. Z., Grande, R., Vitale, I., Niro, A., Molinaro, G., Prezioso, S., Muraro, R., & Di Giovanni, P. 2021. Microbial species isolated from infected wounds and antimicrobial resistance analysis: Data emerging from a three-years retrospective study. *Antibiotics*, *10*(10).

Putri, W. E., & Anindhita, M. A. 2022. Optimasi Formula Gel Ekstrak Etanol Buah Kapulaga dengan Kombinasi Gelling Agent HPMC dan Natrium Alginat Menggunakan Simplex Lattice Design. *Jurnal Ilmiah Farmasi Special Edition, 107-120.*

Qian, H., Ye, Z., Pi, L., & Ao, J. 2022. Roles and current applications of S-nitrosoglutathione in anti-infective biomaterials. *Materials Today Bio, 16*, 1-17

Rahayuningdyah, D. W., Lyrawati, D., Widodo, F., & Puspita, O. E. 2020. Pengembangan Formula Hidrogel Balutan Luka Menggunakan

Kombinasi Polimer Galaktomanan dan PVP. *Pharmaceutical Journal of Indonesia, 5*(2), 117-122.

Raju, N. R., Silina, E., Stupin, V., Manturova, N., Chidambaram, S. B., & Achar, R. R. 2022. Multifunctional and Smart Wound Dressings — A Review on Recent Research Advancements in Skin Regenerative Medicine. *Pharmaceutics*, *14*, 1–22.

Ribeiro, C. A., Rahman, L. A., Holmes, L. G., Woody, A. M., Webster, C. M., Monaghan, T. I., Robinson, G. K., Mühlschlegel, F. A., Goodhead, I. B., & Shepherd, M. 2021. Nitric Oxide (NO) Elicits Aminoglycoside Tolerance in Escherichia coli but Antibiotic Resistance Gene Carriage and NO Sensitivity Have Not Co-evolved. *Archives of Microbiology*, *203*(5), 2541–2550.

Rowe, R. C., Paul, J. S., Walter, G. C., & Marian, E. F. 2006. *Pharmaceutical Excipients*. Pharmaceutical Press and The American Pharmacists Association London: UK.

Sari, R., Erawati, T., Fauziah, F., & Yuniarti, W. M. 2019. Formulation, Physical Characterization and Wound Healing Activity Evaluation of Carboxymethyl Chitosan-Curcumin Carbomer -Based Hydrogel. *International Journal of Drug Delivery Technology*, *9*(4), 697–703.

Schairer, D. O., Chouake, J. S., Nosanchuk, J. D., & Friedman, A. J. 2012. The Potential of Nitric Oxide Releasing Therapies as Antimicrobial Agents. *Landes Bioscience*, *3*(3), 271–279.

Selviana, G. A., & Haryanto. 2022. Pengaruh Penambahan Carboxymethyl Cellulose Terhadap Karakteristik Hidrogel Film Polivinil Alkohol Sebagai Aplikasi Pembalut Luka dengan Chemical Crosslinking Method. *TECHNO, 2*(23), 121-130.

Shah, S. U., Socha, M., Sejil, C., & Gibaud, S. 2017. Microparticules de glutathion et de S-nitrosoglutathion à base d'Eudragit® FS30D et obtenues par spray drying. *Annales Pharmaceutiques Francaises*, *75*(2), 95–104.

Shariatinia, Z. 2018. Carboxymethyl chitosan: Properties and biomedical applications. *Int. J. Biol. Macromol, 120,* 1406–1419.

Shi, C., Wang, C., Liu, H., Li, Q., Li, R., Zhang, Y., Liu, Y., Shao, Y., & Wang, J. 2020. Selection of Appropriate Wound Dressing for Various Wounds. *Frontiers in Bioengineering and Biotechnology*, *8*(182), 1–17.

Sim, P., Strudwick, X. L., Song, Y. M., Cowin, A. J., & Garg, S. 2022. Influence of Acidic pH on Wound Healing In Vivo: A Novel Perspective for Wound Treatment. *International Journal of Molecular Sciences*, *23*(21), 1-15.

Sonip, A., Aprilina, E., Sagala, S. A. B., Risanti, M., Kurniati, M., & Irzaman. 2015. Analisis Ikatan Molekul Protein (Gugus Fungsi C-N) pada Miselium jamur Tiram dengan Metode Fourier Transform Infra-Red (FTIR). *Prosiding Seminar Nasional Fisika (E-Journal)*, *IV*, 1–6.

Tavares, G., Alves, P. & Simões, P. 2022. Recent Advances in Hydrogel-Mediated Nitric Oxide Delivery Systems Targeted for Wound Healing Applications. *Pharmaceutics, 14*(7).

Vanti, G., Wang, M., Bergonzi, C. M., Zhidong, L., & Bilia, R. A. 2020. International Journal of Biological Macromolecules Hydroxypropyl methylcellulose hydrogel of berberine chloride-loaded escinosomes : Dermal absorption and biocompatibility. *International Journal of Biological Macromolecules*, *164*, 232–241.

Vercelino, R., Cunha, T. M., Ferreira, E. S., Cunha, F. Q., Ferreira, S. H., & De Oliveira, M. G. 2013. Skin Vasodilation and Analgesic Effect of A Topical Nitric Oxide-Releasing Hydrogel. *Journal of Materials Science: Materials in Medicine*, *24*(9), 2157–2169.

Vu, H., Nair, A., Tran, L., Pal, S., Senkowsky, J., Hu, W., & Tang, L. 2020. A Device to Predict Short-Term Healing Outcome of Chronic Wounds. *Advances in Wound Care*, *9*(6), 312–324.

Wang, Z., Wen, F., Zhang, R., & Zhang, Q. 2017. Modulated Nitric Oxide Delivery in Three-Dimensional Biomaterials for Vascular Functionality. *Materials Research Society Communications,* 1-13.

Wiegand, S. B., Traeger, L., Nguyen, H. K., Rouillard, K. R., Fischbach, A., Zadek, F., Ichinose, F., Schoenfisch, M. H., Carroll, R. W., Bloch, D. B., & Zapol, W. M. 2021. Antimicrobial Effects of Nitric Oxide in Murine Models of Klebsiella pneumonia. *Redox Biology*, *39*, 1–8.

Wu, H., Du, S., Lu, Y., Li, Y., & Wang, D. 2014. The application of biomedical polymer material hydroxy propyl methyl cellulose (HPMC) in pharmaceutical preparations. *Journal of Chemical and Pharmaceutical Research*, *6*(5), 155–160.

Yu, R., de Saint-Cyr, L. C., Soussan, L., Barboiu, M., & Li, Suming. 2020. Anti-bacterial Dynamic Hydrogels Prepared from O-carboxymethyl Chitosan by Dual Imine Bond Crosslinking for Biomedical

Applications. *International Journal of Biological Macromolecules,* 1146-1155.

Zainal, S. H., Mohd, N. H., Suhaili, N., Anuar, F. H., Lazim, A. M., & Othaman, R. 2021. Preparation of Cellulosa-Based Hydrogel: A Review. *Journal of Materials Research anf Technology*, *10*, 935-952.

Zhang, Q., & Meyerhoff, M. E. 2021. Nitric Oxide Release for Enhanced Biocompatibility and Analytical Performance of Implantable Electrochemical Sensors. *Electroanalysis, 33*(9), 1997-2015.

Zhang, M., Yang, M., Woo, M. W., Li, Y., Han, W., & Dang, X. 2021. High-Mechanical Strength Carboxymethyl Chitosan-based Hydrogel Film for Antibacterial Wound Dressing. *Carbohydrate Polymers, 256*, 1-9.

LAMPIRAN

Lampiran 1. Hasil Uji pH Sediaan *In Situ Hydrogel*

Formula	Konsentrasi HPMC:CMCS	pH	Rata-Rata±SD
F1	2,5%:0,5%	6,16 6,14 6,15	6,15±0,01
F2	5%:0,5%	6,16 6,10 6,07	6,11±0,04
F3	7,5%:0,5%	6,24 6,22 6,20	6,22±0,02
F4	7,5%:0,5% (tanpa GSNO)	7,10 7,12 7,11	7,11±0,01

Lampiran 2. Hasil Uji *Swelling*

a. F1 (2,5%:0,5%:1%)

Waktu (menit)	Berat (g)		
	I	II	III
0	0,10	0,10	0,10
30	0,63	0,56	0,56
60	0,81	0,62	0,65
90	0,96	0,72	0,82
120	1,03	0,87	0,88
150	1,08	0,91	0,94
180	1,23	0,99	1,08
210	1,39	1,13	1,18
240	-	-	-
270	-	-	-
300	-	-	-

b. F2 (5%:0,5%:1%)

Waktu (menit)	Berat (g)		
	I	II	III
0	0,10	0,10	0,10
30	0,64	0,81	0,73
60	0,74	1,00	0,86
90	0,90	1,09	1,00
120	0,96	1,23	1,21
150	1,08	1,35	1,26
180	1,20	1,58	1,29
210	1,29	1,63	1,41
240	1,44	1,82	1,60
270	1,57	1,95	1,67
300	-	-	-

c. F3 (7,5%:0,5%:1%)

Waktu (menit)	Berat (g)		
	I	II	III
0	0,10	0,10	0,10
30	0,98	0,76	0,81
60	1,14	0,90	0,96
90	1,30	1,06	1,11
120	1,48	1,15	1,29
150	1,64	1,29	1,42
180	1,89	1,51	1,66
210	2,08	1,72	1,80
240	2,43	1,87	2,13
270	2,61	2,24	2,39
300	3,48	2,53	2,39

d. F4 (7,5%:0,5%:0%)

Waktu (menit)	Berat (g)		
	I	II	III
0	0,10	0,10	0,10
30	0,78	1,17	0,92
60	1,15	1,68	1,24
90	1,28	1,98	1,35
120	1,39	2,12	1,42
150	1,46	2,22	1,48
180	1,55	2,35	1,55
210	1,69	2,48	1,65
240	1,67	2,59	1,86
270	1,89	2,67	2,02
300	-	-	-

Contoh perhitungan *swelling*(%) pada F1 menit ke-210:

Diketahui:

Berat awal hidrogel (Wd) : 0,10 g Berat akhir hidrogel (Ws) : 1,39 g

Maka,

$$S\% = \frac{\text{Berat akhir hidrogel (Ws)} - \text{Berat awal hidrogel (Wd)}}{\text{Berat awal hidrogel (Wd)}} \text{ x } 100\%$$

$$S\% = \frac{1,39-0,1}{0,1} \; x \; 100\%$$

$$S\% = \frac{1,29}{0,1} \; x \; 100\%$$

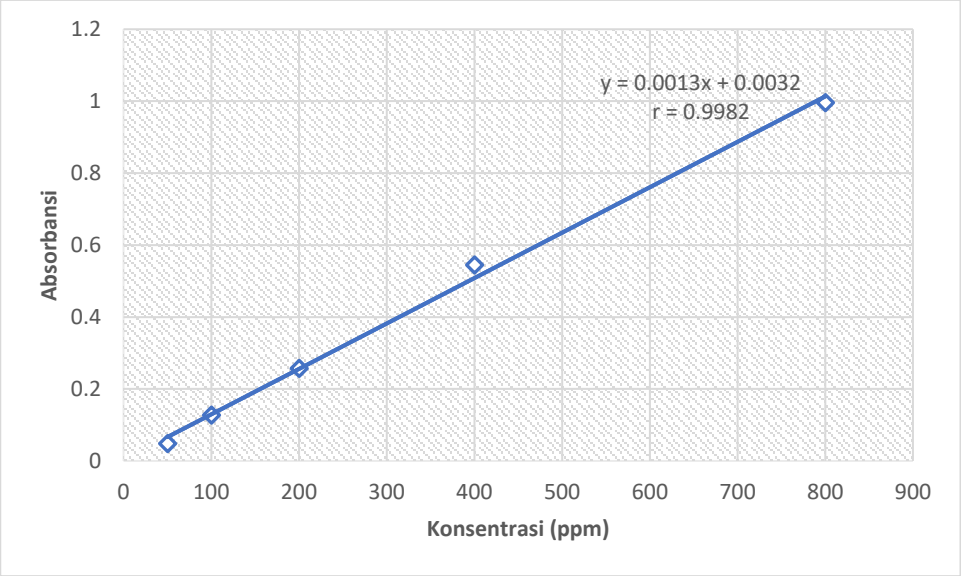
S% = 12,9 x 100%

S% = 1290%

Lampiran 3. Penetapan Kurva Baku dan Pengukuran Kandungan Obat GSNO dalam Sediaan *In Situ Hydrogel* GSNO

a. Penetapan kurva baku GSNO

Konsentrasi (ppm)	Absorbansi
800	0,996
400	0,545
200	0,257
100	0,127
50	0,048



b. Pengukuran kandungan obat GSNO

Formula	Absorbansi	%Kadar	Rata-rata ± SD
F1	0,252	95,69	96,97±1,17%
	0,256	97,23	
	0,258	98,00	
F2	0,139	94,10	95,95±2,11%
	0,141	95,49	
	0,145	98,26	
F3	0,126	94,46	96,00±1,53%
	0,13	97,53	
	0,128	96,00	

Contoh perhitungan %kadar GSNO pada F1 replikasi 1

Diketahui:

10 mg sediaan *in situ hydrogel* GSNO $\xrightarrow{\text{dilarutkan}}$ 10 ml aquadest
(diukur absorbansinya)

Absorbansi F1 replikasi 1 = 0,25

Konsentrasi GSNO yang digunakan dalam formula 1 sebesar 1% (0,1 g /10 g berat *in situ hydrogel*)

Berat *in situ hydrogel* kering dari 10 g menjadi 0,5 g, sehingga secara teroritis dalam 1 mg *in situ hydrogel* kering mengandung GSNO sebesar 200 µg GSNO/ mg sediaan *in situ hydrogel* kering.

Persamaan kurva baku = 0,0013x + 0,0032

Maka,

0,252 = 0,0013x + 0,0032

X = (0,252 – 0,0032)/ 0,0013

X = 191,384 µg/ml

Jumlah GSNO dalam formula $= \frac{\text{X . fp .10 ml}}{\text{berat } in\ situ\ hydrogel \text{ yang ditimbang}}$

Jumlah GSNO dalam formula $= \frac{191{,}384\ \mu\frac{g}{ml} .\ 1 .\ 10\ ml}{10\ mg}$

Jumlah GSNO dalam formula = 191,384 µg GSNO/mg sediaan

%Kandungan GSNO $= \frac{Kadar\ GSNO\ dalam\ sediaan\ hasil\ analisis}{Kadar\ GSNO\ dalam\ sediaan\ secara\ teoritis}\ x\ 100\%$

$= \frac{191{,}384\ \mu g/mg}{200\ \mu g/mg}\ x\ 100\% = 95{,}69\%$

Lampiran 4. Data Hasil Analisis Statistik

Lampiran 4.1 Uji pH

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
pH	F1	.175	3	.	1.000	3	1.000
	F2	.253	3	.	.964	3	.637
	F3	.175	3	.	1.000	3	1.000
	F4	.175	3	.	1.000	3	1.000

a. Lilliefors Significance Correction

ANOVA

pH

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.049	3	.683	1011.963	.000
Within Groups	.005	8	.001		
Total	2.055	11			

Multiple Comparisons

Dependent Variable: pH

Tukey HSD

		Mean Difference			95% Confidence Interval	
(I) Formula	(J) Formula	(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
F1	F2	.04000	.02121	.305	-.0279	.1079
	F3	-.07000*	.02121	.044	-.1379	-.0021
	F4	-.96000*	.02121	.000	-1.0279	-.8921
F2	F1	-.04000	.02121	.305	-.1079	.0279
	F3	-.11000*	.02121	.004	-.1779	-.0421
	F4	-1.00000*	.02121	.000	-1.0679	-.9321
F3	F1	.07000*	.02121	.044	.0021	.1379
	F2	.11000*	.02121	.004	.0421	.1779
	F4	-.89000*	.02121	.000	-.9579	-.8221
F4	F1	.96000*	.02121	.000	.8921	1.0279
	F2	1.00000*	.02121	.000	.9321	1.0679
	F3	.89000*	.02121	.000	.8221	.9579

*. The mean difference is significant at the 0.05 level.

Lampiran 4.2 Uji *Swelling*

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Swelling	F1	.317	3	.	.888	3	.348
	F2	.286	3	.	.930	3	.490
	F3	.342	3	.	.845	3	.226
	F4	.328	3	.	.871	3	.298

a. Lilliefors Significance Correction

ANOVA

Rasion Swelling

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4012758.333	3	1337586.111	9.159	.006
Within Groups	1168333.333	8	146041.667		
Total	5181091.667	11			

Multiple Comparisons

Dependent Variable: swelling

Tukey HSD

		Mean Difference			95% Confidence Interval	
(I) Formula	(J) Formula	(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
F1	F2	-496.66667	312.02742	.434	-1495.8883	502.5550
	F3	-1566.66667*	312.02742	.005	-2565.8883	-567.4450
	F4	-960.00000	312.02742	.060	-1959.2216	39.2216
F2	F1	496.66667	312.02742	.434	-502.5550	1495.8883
	F3	-1070.00000*	312.02742	.036	-2069.2216	-70.7784
	F4	-463.33333	312.02742	.488	-1462.5550	535.8883
F3	F1	1566.66667*	312.02742	.005	567.4450	2565.8883
	F2	1070.00000*	312.02742	.036	70.7784	2069.2216
	F4	606.66667	312.02742	.284	-392.5550	1605.8883
F4	F1	960.00000	312.02742	.060	-39.2216	1959.2216
	F2	463.33333	312.02742	.488	-535.8883	1462.5550
	F3	-606.66667	312.02742	.284	-1605.8883	392.5550

*. The mean difference is significant at the 0.05 level.

Lampiran 4.3 Uji Kandungan Obat

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	formulasi	Statistic	df	Sig.	Statistic	df	Sig.
KandunganObat	F1	.253	3	.	.964	3	.637
	F2	.253	3	.	.965	3	.639
	F3	.175	3	.	1.000	3	.996

a. Lilliefors Significance Correction

ANOVA

Kandungan obat

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.003	2	1.002	.365	.708
Within Groups	16.450	6	2.742		
Total	18.453	8			

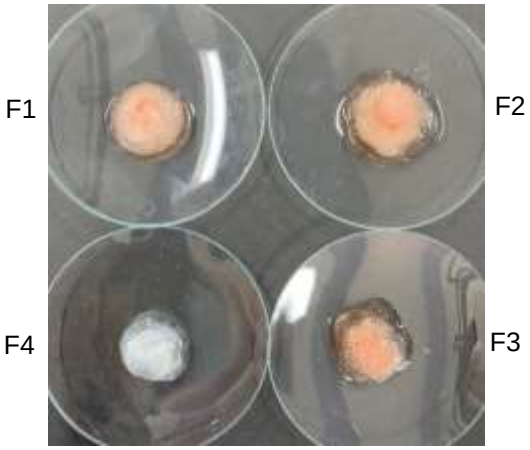
Lampiran 5. Dokumentasi Penelitian

Gambar 14. Hasil sintesis GSNO

Gambar 15. Uji pH menggunakan pH meter

Gambar 16. Pengukuran *drug loading* menggunakan spektrofotometer UV-Vis

Gambar 17. Formulasi *in situ hydrogel* GSNO. Sediaan *in situ hydrogel* sebelum *freeze drying* (a); Sediaan *in situ hydrogel* setelah *freeze drying* (b)



Gambar 18. Uji *swelling.* Keterangan: F1=2,5%:0,5%:1%; F2=5%:0,5%:1%; F3=7,5%:0,5%:1%; F4=7,5%:0,5%:0%