

## DAFTAR PUSTAKA

1. Sukandar El a, Andrajati R, Sigit JI, Adnyana IK, Setiadi AAP, Kusnandar. ISO Farmakoterapi. 1st ed. jakarta: PT ISFI Penerbitan; 2015.
2. Bloch MJ. Worldwide prevalence of hypertension exceeds 1.3 billion. *J Am Soc Hypertens* [Internet]. 2016;10(10):753–4. Available from: <http://dx.doi.org/10.1016/j.jash.2016.08.006>
3. Kemenkes RI. Hasil Riset Kesehatan Dasar Tahun 2018. Kementerian Kesehat RI. 2018;53(9):1689–99.
4. Ram CVS. Hypertension: a clinical guide. Diagnosis and evaluation of hypertension. Florida: CRC Press Taylor & Francis Group; 2014.
5. Tarigan NS, Tarigan A, Sukohar A CN. Prescribing and Rationality of Antihypertension Drugs Utilization on Outpatient with Hypertension in Puskesmas Simpung During Januari-Juni 2013 Bandar Lampung. *Fac Med Lampung Univ*. 2013;3(4):119–28.
6. Jaya AH, Sarasmita MA, Karsana AAR. Efektivitas Antihipertensi dalam Memperbaiki Derajat Protein Urin pada Pasien Diabetes Melitus Tipe 2 di RSUP Sanglah Denpasar. *J Farm Udayana*. 2017;6(2):169–72.
7. Setiawati MC, Yuniarti N. Evaluasi penggunaan kaptopril dan analisisbiayanya apda pasien rawat jalan di RSUD kota Salatiga. *Semin Nas Farm 2010 imunomodulator dan perkembangannya*. 2010;
8. Adam MR, Ibrahim A, Utami AI. Evaluasi Penggunaan Obat Antihipertensi pada Pasien Hipertensi Rawat Jalan di Puskesmas Sempaja Samarinda. *J Sains dan Kesehat*. 2015;1(2):82–9.
9. Kemenkes RI. Farmakope Indonesia. VI. jakarta: Direktorat Jendral Bina Kefarmasian dan Alat Kesehatan Republik Indonesia; 2020. 821 p.
10. Duchin KL, McKinstry DN, Cohen AI, Migdalof BH. Pharmacokinetics of Captopril in Healthy Subjects and in Patients with Cardiovascular Diseases. *Clin Pharmacokinet*. 1988;14(4):241–59.
11. Rivai H, Andalas U. Development and Validation of Analysis Methods of Captopril in Tablets with Methods of Area under Curves and Absorbance by Ultraviolet-Visible Spectrophotometry. 2018;(April).
12. L.H O. Angiotensin converting enzyme inhibitors. New York: Wiley-Liss; 1994.
13. Ondetti MA, Rubin B, Cushman DW. Design of specific inhibitors of angiotensin-converting enzyme: new class of orally active antihypertensive agents. *Science (80- )*. 1977;196(4288):441–444.
14. Brown NJ, Vaughan DE. Angiotensin-converting enzyme inhibitors. *Circulation*. 1998;97(14):1411–14142.
15. Information NC for B. PubChem Compound Summary for CID 44093, Captopril [Internet]. Pubchem. 2021 [cited 2021 Jul 8]. Available from: <https://pubchem.ncbi.nlm.nih.gov/compound/Captopril>.
16. Evangelista S, Manzini S. Antioxidant and cardioprotective properties of the sulphhydryl angiotensin-converting enzyme inhibitor zofenopril. *J Int Med Res*. 2005;33:42–54.
17. Pascard C. Small-molecule crystal structures as a structural basis for drug design. *Acta Crystallogr Sect D Biol Crystallogr*. 1995;51(4):407–17.
18. Tache F, Medvedovici A, David V. Captopril. 2004;1(3):447–50.
19. MI P, S K. Angiotensin II as a pro-inflammatory mediator. *Curr Opin Investig Drugs*. 2002;3(4):569–77.

20. Hosseini M, Sharifi MR, Alaei H, Shafei MN, Karimooy HAN. Effects of angiotensin II and captopril on rewarding properties of morphine. *Indian J Exp Biol.* 2007;45(9):770–7.
21. Zhang B, Jiang T, Tuo Y, Jin K, Luo Z, Shi W, et al. Captopril improves tumor nanomedicine delivery by increasing tumor blood perfusion and enlarging endothelial gaps in tumor blood vessels. *Cancer Lett.* 2017;410(September):12–9.
22. Miguel-Carrasco JL, Zambrano S, Blanca AJ, Mate A, Vázquez CM. Captopril reduces cardiac inflammatory markers in spontaneously hypertensive rats by inactivation of NF- $\kappa$ B. *J Inflamm.* 2010;7:1–9.
23. American Society of Health-System Pharmacists. *AHFS Drug Information Essentials (Updated till November 2011).* 2011.
24. Popovici RF, Alexa IF, Novac O, Vranceanu N, Popovici E, Lupusoru CE, et al. Pharmacokinetics study on mesoporous silica-captopril controlled release systems. *Dig J Nanomater Biostructures.* 2011;6(4):1619–30.
25. Ahmed NR. An Indirect Spectrophotometric Determination of Mesna in Pharmaceuticals and Environmental Samples. *Iraqi Natl J Chem.* 2013;49:1–11.
26. Amjadi M, Manzoori JL, Hassanzadeh J, Sorouraddin MH. Permanganate-bromide-silver nanoparticles as a new chemiluminescence system and its application to captopril determination. *Talanta [Internet].* 2013;115:600–5. Available from: <http://dx.doi.org/10.1016/j.talanta.2013.06.016>
27. Barbosa-García O, Ramos-Ortíz G, Maldonado JL, Pichardo-Molina JL, Meneses-Nava MA, Landgrave JEA, et al. UV-vis absorption spectroscopy and multivariate analysis as a method to discriminate tequila. *Spectrochim Acta - Part A Mol Biomol Spectrosc.* 2007;66(1):129–34.
28. Torbeck L. Pharmaceutical and Medical Device Validation by Experimental Design. *J Valid Technol.* 2010;16(3):9–11.
29. Suhartati T. *Dasar-Dasar Spektrofotometri UV-Vis dan Spektrometri Massa untuk Penentuan Struktur Senyawa Organik.* CV. Anugrah Utama Raharja; 2013.
30. T O. *Fundamentals of UV-visible Spectroscopy: A Workbook,* 1st edition. Berlin: Hewlett Packard Company; 1998.
31. Asahi R, Morikawa T, Ohwaki T, Aoki K, Taga Y. Visible-light photocatalysis in nitrogen-doped titanium oxides. *Science (80- ).* 2001;293(5528):269–71.
32. Schmid F, Beer L. *Biological Macromolecules : Spectrophotometry.* London: Macmillan; 2001. 1–4 p.
33. Esfandiary R, Middaugh C. Ultraviolet absorption spectroscopy. In *Analysis of Aggregates and Particles in Protein Pharmaceuticals.* Mahler H., Jiskoot W, editors. New Jersey: John Wiley & Sons; 2012. 171–200 p.
34. Gandjar IG, Rohman A. *Kimia Farmasi Analisis.* Yogyakarta: Pustaka Pelajar; 2012.
35. Roberts J, Power A, Chapman J, Chandra S, Cozzolino D. The use of UV-Vis spectroscopy in bioprocess and fermentation monitoring. *Fermentation.* 2018;4(1).
36. Skoog D, Holler F, Crouch F. *Instrumental analysis.* Belmont: Brooks/Cole, Cengage Learning; 2007.
37. Rocha FS, Gomes AJ, Lunardi CN, Kaliaguine S, Patience GS. Experimental methods in chemical engineering: Ultraviolet visible spectroscopy—UV-Vis. *Can J Chem Eng.* 2018;96(12):2512–7.
38. Verma G, Mishra M. DEVELOPMENT AND OPTIMIZATION OF UV-VIS

- SPECTROSCOPY - A REVIEW. 2018;7(11):1170–80.
39. Thammana M. A review on high performance liquid chromatography. *Int J Pharm Res.* 2016;5(2):22–8.
  40. Vidushi Y, Meenakshi B. Hplc Method Development and Validation: a Review. *research J life Sci Bioinformatics, Pharm Chem Sci.* 2017;2(6):166.
  41. Johnson E., Stevenson R. *Basic Liquid Chromatography.* Bandung: ITB Press; 1991.
  42. Kazakevich Y, Lobrutto R. *HPLC for Pharmaceutical Scientist.* new jersey: John Wiley & Sons; 2007.
  43. McCalley D V. The challenges of the analysis of basic compounds by high performance liquid chromatography: Some possible approaches for improved separations. *J Chromatogr A.* 2010;1217(6):858–80.
  44. Susanti M, Dachriyanus. *Kromatografi Cair Kinerja Tinggi.* Padang: Carano Pustaka Universitas Andalas; 2017.
  45. Dewianti ZP, Aprilliani A, Damayanti H. Ofloksasin Article Review : Liquid Chromatographic Methods for Enantio Separation of Ofloxacin. 2019;VI(2):65–71.
  46. Sharma S, Mehtab S. *Voltammetry : An Electrochemical Analytical Method Chapter - 7 Voltammetry: An Electrochemical Analytical Method.* 2020;(December).
  47. Delahay P, Mamantov G. *Voltammetry at Constant Current: Review of Theoretical Principles.* *Anal Chem.* 1955;27(4).
  48. Batchelor-Mcauley C, Kätelhön E, Barnes EO, Compton RG, Laborda E, Molina A. Recent Advances in Voltammetry. *ChemistryOpen.* 2015;4(3):224–60.
  49. Harnisch F, Freguia S. A basic tutorial on cyclic voltammetry for the investigation of electroactive microbial biofilms. *Chem - An Asian J.* 2012;7(3):466–75.
  50. Stojek Z. *Pulse Voltammetry. Electroanalytical Methods.* 2nd ed. Berlin: Springer; 2010.
  51. Srivastava AK, Upadhyay SS, Rawool CR, Punde NS, Rajpurohit AS. Voltammetric Techniques for the Analysis of Drugs using Nanomaterials based Chemically Modified Electrodes. *Curr Anal Chem.* 2018;15(3):249–76.
  52. Scholz F. *Voltammetric techniques of analysis: the essentials.* ChemTexts. 2015;1(4):1–24.
  53. Wang J, Rongrong X, Baomin T, Wang J, Renschler CL, White CA. Nanoband electrodes for electrochemical stripping measurements down to the attomole range. *Anal Chim Acta.* 1994;293(1–2):43–8.
  54. JC C, BM A, TA DA, JL RJ, NR P, VS F. Determination of 4-methylbenzilidene camphor in sunscreen by square wave voltammetry in media of cationic surfactant. *Microchem J.* 2007;85(2):301–7.
  55. Amare M, Admassie S. Polymer modified glassy carbon electrode for the electrochemical determination of caffeine in coffee. *Talanta [Internet].* 2012;93:122–8. Available from: <http://dx.doi.org/10.1016/j.talanta.2012.01.058>
  56. Gulaboski R, Mirčeski V, Bogeski I, Hoth M. Protein film voltammetry: Electrochemical enzymatic spectroscopy. A review on recent progress. *J Solid State Electrochem.* 2012;16(7):2315–28.
  57. McKelvie ID. *Principles of Flow Injection Analysis [Internet].* Vol. 54, *Comprehensive Analytical Chemistry.* Elsevier; 2008. 81–109 p. Available from: [http://dx.doi.org/10.1016/S0166-526X\(08\)00604-1](http://dx.doi.org/10.1016/S0166-526X(08)00604-1)

58. F.R.P R, J.A N, O.F F. Flow analysis strategies to greener analytical chemistry. An overview. *Green Chem.* 2001;3:216–20.
59. Melchert WR, Reis BF, Rocha FRP. Green chemistry and the evolution of flow analysis. A review. *Anal Chim Acta* [Internet]. 2012;714:8–19. Available from: <http://dx.doi.org/10.1016/j.aca.2011.11.044>
60. Kalrberg B, Pacey GE. *Flow Injection Analysis. A Practical Guide.* Amsterdam: Elsevier Science Publisher B.V.; 1989.
61. Badan Pengawas Obat dan Makanan. Peraturan Pemerintah Republik Indonesia No 72 [Internet]. jakarta; 1998. Available from: <https://linkinghub.elsevier.com/retrieve/pii/B012226765600013X>
62. Gayathri P. Research and Reviews : Journal of Chemistry A mini review on Oral dosage forms. *Res Rev J Chem* [Internet]. 2016;5(2):130–7. Available from: <http://www.rroj.com/open-access/a-mini-review-on-oral-dosage-forms-.php?aid=78075>
63. Murtini G. *Farmestika Dasar.* Kemenkes RI. jakarta: Kemenkes RI; 2016. 168 p.
64. Murtini G, Elisa Y. *Teknologi Sediaan Solid.* jakarta: Kemenkes RI; 2018.
65. DS W, YD F, AC G, EJ L, A M, JR G, et al. Captopril [Internet]. DrugBank. 2021 [cited 2021 Jul 8]. Available from: <https://go.drugbank.com/drugs/DB01197>
66. Lacourcière Y, Lebel M, Graney WF, Forchette CA, Block AJ. Effect of captopril injection in patients with moderate to severe hypertension. *Am J Hypertens.* 1990;3(10):769–74.
67. Rademaker M, Shaw TRD, Williams BC, Duncan FM, Corrie J, Eglen A, et al. Intravenous captopril treatment in patients with severe cardiac failure. *Br Heart J.* 1986;55(2):187–90.
68. Mali N, Karpe M, Kadam V. A review on biological matrices and analytical methods used for determination of drug of abuse. *J Appl Pharm Sci.* 2011;1(6):58–65.
69. Lakshmana S, K. Suriyaprakash TN. Extraction of Drug from the Biological Matrix: A Review. *Appl Biol Eng - Princ Pract.* 2012;(March).
70. Harahap Y. *Peran Bioanalisis dalam Penjaminan Kualitas Obat dan Peningkatan Kualitas Hidup Pasien.* jakarta: UI Press; 2010.
71. R.Nageswara Rao\*, L.Sivasanker Reddy, Srikanth PVK and VR. Method Development And Validation Of Captopril In Pure And Solid Dosage Form By Uv Spectrophotometry; *Int J Trends Pharm Life Sci.* 2016;2(5):960-968.
72. Belal S, Abdel-Razak O, El-Walily AF, Bakry R. Spectrophotometric determination of captopril and penicillamine through the use of ligand exchange complexation reactions. *Int J Biomed Sci.* 2011;7(4):289–94.
73. Sultana N, Arayne MS, Naveed S. RP-HPLC Method for Simultaneous Determination of Captopril and Diuretics: Application in Pharmaceutical Dosage Forms and Human Serum. *J Chromatogr Sep Tech.* 2011;02(02):2–5.
74. Rastkari N, Khoobi M, Shafiee A, Khoshayand MR, Ahmadkhaniha R. Development and validation of a simple and sensitive HPLC-UV method for the determination of captopril in human plasma using a new derivatizing reagent 2-naphthyl propiolate. *J Chromatogr B Anal Technol Biomed Life Sci* [Internet]. 2013;932:144–51. Available from: <http://dx.doi.org/10.1016/j.jchromb.2013.06.019>
75. Karakosta TD, Tzanavaras PD, Themelis DG. Automated determination of total captopril in urine by liquid chromatography with post-column

- derivatization coupled to on-line solid phase extraction in a sequential injection manifold. *Talanta* [Internet]. 2012;88:561–6. Available from: <http://dx.doi.org/10.1016/j.talanta.2011.11.034>
76. Logoyda L, Kondratova Y, Korobko D, Soroka Y. Development of ultra-high-performance liquid chromatography method for the determination of captopril in pharmaceutical dosage forms. *Asian J Pharm Clin Res.* 2017;10(11):308–10.
  77. Khamanga SM, Walker RB. The use of experimental design in the development of an HPLC-ECD method for the analysis of captopril. *Talanta* [Internet]. 2011;83(3):1037–49. Available from: <http://dx.doi.org/10.1016/j.talanta.2010.11.025>
  78. Gatti R, Morigi R. 1,4-Anthraquinone: A new useful pre-column reagent for the determination of N-acetylcysteine and captopril in pharmaceuticals by high performance liquid chromatography. *J Pharm Biomed Anal* [Internet]. 2017;143:299–304. Available from: <http://dx.doi.org/10.1016/j.jpba.2017.06.011>
  79. El-Gindy A, Nassar MW, Attia KAS, Abu-Seada HH, El-Ghandour M. Stability-indicating HPLC method for simultaneous determination of captopril, indapamide, and their related compounds. *J Liq Chromatogr Relat Technol.* 2014;37(5):696–712.
  80. N S, S N. Direct Determination of Four ACE-Inhibitors Lisinopril, Enalapril, Captopril and Fosinopril in Pharmaceuticals and Serum by HPLC. *J Chromatogr Sep Tech.* 2013;04(04).
  81. Sun Y, Zhang Z, Zhang X. Determination of captopril by high-performance liquid chromatography with direct electrogenerated chemiluminescence. *Spectrochim Acta - Part A Mol Biomol Spectrosc* [Internet]. 2013;105:171–5. Available from: <http://dx.doi.org/10.1016/j.saa.2012.11.109>
  82. Habibi D, Faraji AR, Gil A. A highly sensitive supported manganese-based voltammetric sensor for the electrocatalytic determination of captopril. *Sensors Actuators, B Chem* [Internet]. 2013;182:80–6. Available from: <http://dx.doi.org/10.1016/j.snb.2013.02.095>
  83. Bagheri H, Karimi-Maleh H, Karimi F, Mallakpour S, Keyvanfard M. Square wave voltammetric determination of captopril in liquid phase using N-(4-hydroxyphenyl)-3,5-dinitrobenzamide modified ZnO/CNT carbon paste electrode as a novel electrochemical sensor. *J Mol Liq* [Internet]. 2014;198:193–9. Available from: <http://dx.doi.org/10.1016/j.molliq.2014.06.027>
  84. Ensafi AA, Karimi-Maleh H, Mallakpour S, Rezaei B. Highly sensitive voltammetric sensor based on catechol-derivative-multiwall carbon nanotubes for the catalytic determination of captopril in patient human urine samples. *Colloids Surfaces B Biointerfaces* [Internet]. 2011;87(2):480–8. Available from: <http://dx.doi.org/10.1016/j.colsurfb.2011.06.013>
  85. Shahbakhsh M, Hashemzaei Z, Narouie S, Shahbakhsh Y, Noroozifar M. Gold Nanoparticles/Biphenol–biphenanthroquinone for Ultra-trace Voltammetric Determination of Captopril. *Electroanalysis.* 2020;33(3):713–22.
  86. Bahramipur H, Jalali F. Voltammetric Determination of Captopril Using Chlorpromazine as a Homogeneous Mediator. *Int J Electrochem.* 2011;2011(Cv):1–6.
  87. Beitollahi H, Taher MA, Ahmadipour M, Hosseinzadeh R. Electrocatalytic determination of captopril using a modified carbon nanotube paste electrode: Application to determination of captopril in pharmaceutical and biological

- samples. *Meas J Int Meas Confed* [Internet]. 2014;47(1):770–6. Available from: <http://dx.doi.org/10.1016/j.measurement.2013.10.001>
88. Mazloum-Ardakani M, Sheikh-Mohseni MA, Mirjalili BF, Zamani L. Simultaneous determination of captopril, acetaminophen and tryptophan at a modified electrode based on carbon nanotubes. *J Electroanal Chem* [Internet]. 2012;686:12–8. Available from: <http://dx.doi.org/10.1016/j.jelechem.2012.09.021>
89. Karimi-Maleh H, Moazampour M, Gupta VK, Sanati AL. Electrocatalytic determination of captopril in real samples using NiO nanoparticle modified (9,10-dihydro-9,10-ethanoanthracene-11,12-dicarboximido)-4-ethylbenzene-1,2-diol carbon paste electrode. *Sensors Actuators, B Chem* [Internet]. 2014;199:47–53. Available from: <http://dx.doi.org/10.1016/j.snb.2014.03.050>
90. Absalan G, Akhond M, Karimi R, Ramezani AM. Simultaneous determination of captopril and hydrochlorothiazide by using a carbon ionic liquid electrode modified with copper hydroxide nanoparticles. *Microchim Acta*. 2018;185(2).
91. Chermi SA, Krimi H, Keyvanfard M, Alizad K. Voltammetric determination of captopril using multiwall carbon nanotubes paste electrode in the presence of isoproterenol as a mediator. *Iran J Pharm Res*. 2016;15(1):107–17.
92. Lima MJA, Fernandes RN, Tanaka AA, Reis BF. Development of a new procedure for the determination of captopril in pharmaceutical formulations employing chemiluminescence and a multicommutated flow analysis approach. *Luminescence*. 2016;31(1):288–94.
93. Rodrigues SSM, Santos JLM. Chemiluminometric determination of captopril in a multi-pumping flow system. *Talanta* [Internet]. 2012;96:210–5. Available from: <http://dx.doi.org/10.1016/j.talanta.2012.02.016>
94. Suarez WT, Pessoa-Neto OD, Janegitz BC, Vieira HJ, Faria RC, Fatibello-Filho O. Flow injection spectrophotometric determination of N-acetylcysteine and captopril employing Prussian blue generation reaction. *Anal Lett*. 2011;44(14):2394–405.

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