

DAFTAR PUSTAKA

- Aksuner, N., Henden, E., Yilmaz, I., and Cukurovali, A., 2012, A Novel Optical Chemical Sensor for the Determination of Nickel(II) Based on Fluorescence Quenching of Newly Synthesized Thiazolo-triazol Derivative and Application to Real Samples, *Sens. Actuators, B.*, 269-274.
- Alizadeh, K., Rad, and Nasim, A., 2016, A New Optical Sensor for Selective Monitoring of Nickel Ion Based on A Hydrazone Derivative Immobilized on the Triacetyl Cellulose Membrane, *J. Anal. Bioanal Tech.*, 4(7), 1-6.
- Alizadeh, K., Rezaei, B., and Khazaeli, E., 2014, A New Triazene-1-oxide derivative, Immobilized on the Triacetyl Cellulose Membrane as An Optical Ni(II) Sensor, *Sens. Actuators, B.*, 193, 267-272.
- Alizami H., Ganjali M.R., Norouzi, P., Tajarodi, A., and Hanifehpour, Y., 2007, Fabrication of A Cobalt(II) PVC-Membrane Sensor Based on N-(Antipyrinil)-N'-(2-Methoxyfenil)-thiourea, *J. Chil. Chem. Soc.*, 52(4), 1332-1337.
- Anonim, 2006, *Peraturan Menteri Negara Lingkungan Hidup Republik Indonesia No. 9 tentang Baku Mutu Air Limbah Bagi Usaha dan/ atau Kegiatan Pertambangan Bijih Nikel*, Menteri Negara Lingkungan Hidup, Jakarta.
- Babae, S., Pakdehi, S.G., and Nabavi, A.S., 2016, An Optical Chemical Sensor for Determination of Nickel in Water and Hydrogen Peroxide Samples, *JNDC*, 1(2), 58-69.
- Bhatia, R., and Brinker, C.J., 2000, Aqueous Sol-gel Process for Protein Encapsulation, *Chem. Mater.*, 12, 234-2441.
- Bigotto, A., Costa, G., Galasso, V., and De Alti, G., 1970, Infra-red Spectra and Normal Vibrations of Bis-dimethylglyoximates of Transition Metals, *Spectrochim. Acta.*, (26A), 1939-1949.
- Brinker, C.J., and George W.S., 1990, *Sol-Gel Science: The Physics and Chemistry of Sol-Gel Processing*, Academic Press Inc., San Diego.
- Buckley, A.M., and Greenblatt, M., 1994, The Sol-Gel Preparation of Silica Gels, *J. Chem. Educ.*, 7 (71), 599-602.
- Budiarta, J., 2018, Kajian Perbandingan Hasil Analisis Pb Menggunakan Instrumen *Portable* dan Konvensional, *Skripsi*, Departemen Kimia, Universitas Gadjah Mada, Yogyakarta.

- Calabrese, A., MacInnes, J.R., Nelson, D.A., and Miller, J.E., 1977, Survival and Growth of Bivalve Larvae under Heavy-Metal Stress, *Mar. Biol.*, (14), 179-184.
- Da silva, M.C.H., Da Silva, L.H.M., and Paggioli, F.J., 2005, A Novel Micellar Medium Using Triblock Copolymer for Cobalt Determination, *Anal. Sci.*, 21, 933-937.
- Dattelbaum, A., Baer, G.A., Fox., J.M., Iyer, S., and Dattelbaum, J., 2009, Pegylation of a Maltose Biosensor Promotes Enhanced Signal Response When Immobilized in Silica sol-gel, *Bioconjugate Chem.*, 20, 2381-2384.
- Edward, 2014, Kandungan logam berat dalam sedimen di Perairan Teluk Wawobatu, Kendari, Sulawesi Tenggara, *jipp*, 3(2), 157-165.
- Eggins, B.R., 2002, *Chemical Sensor and Biosensor Analytical Techniques in The Sciences*, John Wiley and Sons, Ltd., University of Ulster, Northern Ireland.
- Fauzy, A., 2018, Enkapsulasi Protein Bovine Serum Albumin (BSA) pada Matriks Silika Gel dari Tetraetilortosilikat (TEOS) dan Tetrametilortosilikat (TMOS) dengan Metode Sol Gel, *Skripsi*, Departemen Kimia, Universitas Gadjah Mada, Yogyakarta.
- Fay, M., Wilbur, S., Abadin, H., Ingerman, L., and Swarts, S.G., 2005, *Toxicological Profile for Nickel*, Agency for Toxic Substances and Disease Registry (ATSDR), Atlanta.
- Frayser, F.A., Galliford, D.J.B., and Yardley, J.T., 1963, The furildioximes. Part I. The Structure of the isomeric furildioximes, *Analyst*, 1044(88), 188-190.
- Fries, J. and Getrost, H., 1997, *Organic Reagents for Trace Analysis*, E.Merck Darmstad, New York.
- Gahler, A.R., Mitchell, A. M. and Mellon, M. G., 1951, Colorimetric Determination of Nickel with Alpha-Furildioxime, *Anal.Chem.*, 3(23), 500-503.
- Gandjar , I.B., dan Rohman, A., 2011, *Kimia Farmasi Analisis*, Edisi 8, Pustaka Pelajar, Yogyakarta.
- Habibah, N., 2015, Pengembangan Beads PVA-Natrium Alginat sebagai Matriks Imobilisasi 1,5-difenilkarbazida untuk Deteksi Cr(VI), *Tesis*, Departemen Kimia, Universitas Gadjah Mada, Yogyakarta.
- Harris, D.C., 2010, *Quantitative Chemical Analysis*, 8th Edition., W.H. Freeman and Company, New York.
- Harvey, D., 2000, *Modern Analytical Chemistry*, Mc Graw-Hill, New York.

- Ichinoki, S., Onishi, C., and Fujii, Y., 2006, Selective Determination of Nickel Ion in River Water by Solvent Extraction with α -Furyl Dioxime, Followed by Reversed-Phase HPLC with Photometric Detection, *J. Liq. Chromatogr. Related Technol*, (29), 2217-2228.
- Jal, P.K., Patel, S., and Mishra, B.K., 2004, Chemical Modification of Silica Surface by Immobilization of Functional Groups for Extractive Concentration of Metal Ions, *Talanta*, 62, 1005-1028.
- Lalena, J.J., David, A.C., Everett, E.C., and Nancy, F.D., 2008, *Inorganic Materials Synthesis and Fabrication*, Wiley Interscience, Canada.
- Mattigod, S.V., Rai, D., Felmy, A.R., and Rao, L., 1997, Solubility and Solubility Product of Crystalline Ni(OH)₂, *J. Solution Chem.*, 4(26), 391-403.
- Maybodi, S.A., and Rezaei, V., 2014, A New Sol-gel Optical Sensor with Nonporous Structure for Determination of Trace Zinc, *Sens. Actuators, B.*, 418-423.
- Memon, N., Memon, S., Solangi, A.R., Soomro, R., and Soomro, R., 2012, Single-channel Flow Injection Spectrophotometric Determination of Nickel using Furildioxime in Micellar Solution, *Sci., World J.*, (2012), 1-5.
- Milea, C.A., Bogatu, C., and Duta, A., 2011, The Influence of Parameters in Silica Sol-Gel Process, *Transilvania*, 1(4), 59-66.
- Misra, S., Dwivedi, S.P., and Singh, R.B., 2010, A Review on Epigenetic of Heavy metals Carcinogenic on Human Health, *Open Nutraceuticals J.*, (3), 188-193.
- Mizuguchi, H., Ishida, R., Kouno, Y., Tachibana, T., Honda, T., Kijima, T., Yamamoto, Y., and Takayanagi, T., 2018, A Rapid Enrichment Technique for The Ultratrace Determination of Nickel in Water Samples using a Nanofiber-composite Membrane Filter, *Anal. Sci.*, 23, 907-912.
- Moersilah, 2016, Pembuatan Membran Sensor Cd(II) dan Co(II) dengan Ligan Turunan Naftol dalam Matriks PMMA dan PVC, *Disertasi*, Departemen Kimia, Universitas Gadjah Mada, Yogyakarta.
- Murthy, Y.L.N., Govindh, B., Diwakar, B.S., and Nagalakshmi, K., 2011, A Simple Inexpensive Detection Method of Nickel in Water using Optical Sensor, *Int. J. ChemTech Res.*, 3(3), 1285-1291.
- Nugraha, M., F., Z., 2018, Enkapsulasi Protein Bovin Serum Albumin (BSA) dalam Silika Gel dari Abu Sekam Padi dan Tetrametilortosilikat (TMOS) dengan Teknik Sol-gel, *Skripsi*, Departemen Kimia, Universitas Gadjah Mada, Yogyakarta.

- Nuryono dan Narsito, 2005, Pengaruh Konsentrasi Asam terhadap Karakter Silika Gel Hasil Sintesis dari Natrium Silikat, *Indones. J. Chem.*, 5(1), 23-30.
- Oscik, J., 1982, *Adsorption*, John Wiley and Sons Inc., Chichester.
- Poltue, T., Rangkupan, R., Dubas, S.T., and Dubas, L., 2011, Nickel(II) Ions Sensing Properties of Dimethylglyoxime/poly(caprolactone) Electrospun Fibers, *Matter. Lett.*, (65), 2231-2234.
- Ponnuwamy, T., and Chyan, O., 2002, Detection of Ni(II) by a Dimethylglyoxime Probe using Attenuated Total-Reflection Infrared Spectroscopy, *Anal. Sci.*, 18, 449-453.
- Pujaatmaka, A.H., dan Setiono, L., 1994, *Vogel Buku Ajar Kimia Analisis Kuantitatif Anorganik*, (Bassett, J., Denney, R.C., Jeffery, G.H., and Mendham, J., 1978, *Vogel's Textbook of Quantitative Inorganic Analysis Including Elementary Instrumental Analysis*, 4th Edition, Longman, London), Edisi 4, Penerbit Buku Kedokteran EGC, Jakarta.
- Rammika, M., Darko, G., Tshentu, Z., and Nelson, J. S., 2011, Dimethylglyoxime based Ion-imprinted Polymer for the Determination of Ni(II) Ions from Aqueous Samples, *Water SA*, 3(37), 321-330.
- Rezaei, B., Hadadzadeh, H., and Azimi, A., 2011, Nickel(II) Selective PVC-Based Membrane Sensor Using Schiff Base, *Int. J. Spectrosc.*, 1-7.
- Riyanto, 2014, *Validasi dan Verifikasi Metode Uji*, Deepublish, Yogyakarta.
- Satake, M., Matsumura, Y., and Fujinaga, T., 1978, Spectrophotometric Determination of Nickel after Separation by Adsorption of its - Furildioxime Complex on Naphthalene, *Talanta*, (25), 718-720.
- Satmoko, Y., 2006, *Kondisi Pencemaran Logam Berat di Perairan Sungai DKI Jakarta*, 1(2), Pusat Teknologi Lingkungan-BPPT, Jakarta.
- Setiono, L., dan Pujaatmaka, A.H., 1985, *Buku Teks Analisis Anorganik Kualitatif Makro dan Semimikro, Edisi kelima, Bagian I*, (Svehla, G., 1979, *Vogel's: Textbook of Macro and Semimicro Qualitative Inorganic Analysis*, 5th Edition, The Chaucer Press, Ltd., Bungay), Edisi 5, Kalman Media Pustaka, Jakarta.
- Shahamirifard, S., A., Ghaedi, M., and Montazerzohori, M. 2018, Design a Sensitive Optical Thin Film Sensor Based on Incorporation of Isonicotinohydrazide Derivative in Sol-gel Matrix for Determination of Trace Amounts of Copper (II) in Fruit Juice: Effect of Sonication Time on Immobilization Approach, *Ultrason. Sonochem.*, (42), 723-730.

- Shahamirifard, S.A., Ghaedi, M., and Hajati, S., 2018, A New Silver (I) Ions Optical Sensor Based on Nanoporous Thin Film of Sol-gel by Rose Bengal Dye, *Sens. Actuators, B.*, 259, 20-29.
- Sharr, G.A., and Soomro G.A., 2004, Spectrophotometric Determination of Cobalt(II), Nikel(II) and Copper(II) with 1-(2-Pyridylazo)-2-Naphthol in Micellar Medium, *The Nucleus*, 41(1-4), 77-82.
- Silva, E.L., Roldan, P.D.S., and Gine, M.F., 2009, Simultaneous Preconcentration of Copper, Cadmium and Nickel in Water Samples by Cloud Point Extraction using 4-(2-pyridylazo)-resorcinol and Their Determination by Inductively Coupled Plasma Optic Emission Spectrometry, *J. Hazard. Mater.*, 171, 1133-1138.
- Silverstein, R.M., Bassler, G.C., and Morrill, T.C., 1980, *Spectrometric Identification of Organic Compounds* 4th Edition, John Wiley and Sons, Inc., New York.
- Sombatsri, S., Wittayakun, J., Sanai, K., Kajsanthia, K., and Prayoonpokarach, 2012, An optical Sensing Film for the Determination of Co(II) Based on Disodium-1-Nitroso-2-Naphthol-3,6-Disulfonate Immobilized in Chitosan Film, *Sens. Actuators, B.*, 772-776.
- Sriyanti, Narsito dan Nuryono, 2001, Selektivitas 2-Merkaptobenzotiazol Terimpregnasi pada Zeolit Alam untuk Adsorpsi Kadmium(II) dalam Campuran Kadmium(II)-Besi(II), *Prosiding Seminar Nasional Kimia IX*, Yogyakarta.
- Thomas, O., and Burgess, C., 2007, *UV-Visible Spectrophotometric of Water and Wastewater*, Elsevier B.V, Amsterdam.
- Ueno, K., Imamura, T., and Cheng, K. L., 1920, *Handbook of Organic Analytical Reagents* 2nd Edition, CRC Press Inc., Florida.