

## DAFTAR PUSTAKA

- Akbari, M., Zebarjad, S. M., Nategb, B., dan Roubani, 2013, A Effect of Nano Silica on Setting Time and Physical Properties of Mineral Trioxide Aggregate, *J. Endod.*, 39(11), 1448–1451.
- Akhavan, H., Mohebbi, P., Firouzi, A., dan Noroozi, M., 2015, X-ray Diffraction Analysis of ProRoot Mineral Trioxide Aggregate Hydrated at Different pH Values, *IEJ*, 11(2), 111-113
- Akhidime, D., Saubade, F., Benson, P., Butler, J., Olivier, S., Kelly, P., Verran, J., dan Whitehead, K., 2018, The Antimicrobial Effect of Metal Substrates on Food Pathogens, *Food Bioprod. Process.*, 113, 68-76
- Al-Sanabani, J.S., Madfa, A.A., dan Al-Sanabani, F.A., 2013, Application of Calcium Phosphate Materials in Dentistry, *Int. J. Biomater.*, 2013, 1-12
- Altan, H. dan Tosun, G., 2016, The Setting Mechanism of Mineral Trioxide Aggregate, *J. Istanbul Univ. Fac. Dent.*, 50(1), 65-72
- Araya, M., Olivares, M., dan Pizarro, F., 2007, Copper in Human Health, *Int. J. Environmental and Health*, 4(1), 608-620
- Bachtiar, Z.A., 2016, Perawatan Saluran Akar pada Gigi Permanen Anak dengan Bahan Gutta Percha, *Jurnal PDGI*, 2(65), 60-67
- Black, G., Ard, D., Smith, J., dan Schibik, T., 2010, The Impact of The Weibull Distribution on The Performance of The Single-Factor ANOVA Model, *Int. J. Ind. Eng.*, 1, 185-198
- Blanca, M.J., Alarcon, R., Arnau, J., Bono, R., dan Bendayan, R., 2017, Non-normal Data: Is ANOVA Still a Valid Option?, *Psicothema*, 4(29), 552-557
- Bogdanović, U., Lazić, V., Vodnik, V., Budimir, M., Marković, Z., dan Dimitrijević, S., 2014, Copper Nanoparticles with High Antimicrobial Activity, *Materials Letters*, 128, 75–78.
- Boleng, D.T., 2015, *Bakteriologi Konsep-Konsep Dasar*, UMM Press, Malang
- Brooks, G.F., Butel, J.S., dan Morse, S.A., 2007, *Mikrobiologi Kedokteran*, Salemba Medika, Jakarta

- Butt, N., Talwar, S., Chaudhry, S., Nawal, R.R., Yadav, S., dan Bali, A., 2017, Comparison of Physical and Mechanical Properties of Mineral Trioxide Aggregate and Biodentine, *IJDR*, 25(6), 692-697
- Camilleri, J. dan Ford, T.R.P., 2006, Review Mineral Trioxide Aggregate: A Review of The Constituents and Biological Properties of The Material, *Int. Endo J.*, 39, 747- 754
- Camilleri, J., 2007, Hydration Mechanism of Mineral Trioxide Aggregate, *Int. Endod. J.*, 40, 462-470
- Camilleri, J., 2014, Clor Stability of White Mineral Trioxide Aggregate in Contact with Hypochlorite Solution, *J. Endod.*, 40, 436-440
- Camilleri, J., Sorrentino, F., dan Damidot, D., 2015, Characterization of Unhydrated and Hydrated Bioaggregate and MTA Angelus, *Clin. Oral Invest.*, 19, 689-698
- Cerda, J.S., Gomez, H.E., Nunez, G.A., Rivero, I.A., Ponce, Y.G., dan Lopez, L.Z.F., 2017, A Green Synthesis of Copper Nanoparticles Using Native Cyclodextrins as Stabilizing Agents, *J. Saudi Chem. Soc.*, 21, 341-348
- Chandra, S., Kumar, A., dan Tomar, K.P., 2014, Synthesis and Characterization of Copper Nanoparticles by Reducing Agent, *J. Saudi Chem. Soc.*, 2(18), 149-153
- Dewiyani, S., 2011, Calcium Hydroxide as Intracanal Dressing for Teeth with Apical Periodontitis, *Dent. J.*, 1(44), 12-16
- Dianat, O., Naseri, M., dan Tabatabaei, S.F., 2017, Evaluation of Properties of Mineral Trioxide Aggregate with Methyl Cellulose as Liquid, *J. Dent.*, 1(14), 7-12
- Din, M., Arshad, F., Hussain, Z., dan Mukhtar, M., 2017, Green Adeptness in the Synthesis and Stabilization of Copper Nanoparticles: Catalytic, Antibacterial, Cytotoxicity, and Antioxidant Activities, *Nanoscale Res. Lett.*, 12(1),1-15
- Dharmayanti, I.A.M.P. dan Sukrama, D.M., 2019, Karakteristik Bakteri *Pseudomonas aeruginosa* dan Pola Kepekaannya Terhadap Antibiotik di *Intensive Care Unit (ICU) RSUP Sanglah* pada Bulan November 2014 – Januari 2015, *E-Jurnal Medika*, 4(8), 1-9

- Dosunmu, E., Chaudhari, A., Shree, S., Dennis, V., dan Pillai, S., 2015, Silver-Coated Carbon Nanotubes Downregulate The Expression of *Pseudomonas Aeruginosa* Virulence Genes: A Potential Mechanism for Their Antimicrobial Effect, *Int. J. Nanomedicine*, 10, 5025-5034
- Dwijayanti, S.I.P. dan Pamungkas, G.S., 2016, Uji Aktivitas Antibakteri Ekstrak Daun Tapak Dara (*Catharantus roseus* (L.) G. Don.) terhadap Bakteri *Staphylococcus aureus* dan *Pseudomonas aeruginosa*, *Biomedika*, 2(9), 11-20
- Estrela, C., Holland, R., Estrela, C., Alencar, A., Sousa, M., dan Pécora, J., 2014, Characterization of Successful Root Canal Treatment, *Braz. Dent. J.*, 25(1), 3-11
- Farrugia, C., Baca, P., Camilleri, J., dan Moliz, M.T.A., 2017, Antimicrobial Activity of ProRoot MTA in Contact with Blood, *Scientific Reports*, 7, 1-10
- Fayyad, D.M., 2017, Physicochemical Properties of Silicate Based Biomaterials, *E.D.J.*, 4(63), 3427-3434
- Gaggeli, E., Kozlowski, H., dan Valensin, D., 2006, Copper Homeostasis and Neurodegenerative Disorders (Alzheimer's, Prion, and Parkinson's Diseases and Amyotrophic Lateral Sclerosis), *Chemical Reviews*, 106, 1995-2044
- Galal, M., Zaki, D.Y., Rabie, M.I., El-Shereif, S.M., dan Hamdy, T.M., 2020, Solubility, PH Change, and Calcium Ion Release of Low Solubility Endodontic Mineral Trioxide Aggregate, *BNRC*, 44(42), 1-5
- Ghasemian, E., Naghoni, A., Rahvar, H., Kialha, M., dan Tabaraie, B., 2015, Evaluating the Effect of Copper Nanoparticles in Inhibiting *Pseudomonas aeruginosa* and *Listeria monogtogenes* Biofilm Formation, *Jundishapur J. Microbiol.*, 8(5), 1-5
- Grech, L., Mallia, B., dan Camilleri, J., 2013, Investigation of The Physical Properties of Tricalcium Silicate Cement-Based Root-End Filling Materials, *Dent. Mater.*, 29, 20-28
- Guerrero, F., Berastegui, E., dan Aspiazu, K., 2018, Porosity Analysis of Mineral Trioxide Aggregate Fillapex and Bioroot Cements for Use in Endodontics Using Microcomputed Tomography, *J. Conserv. Dent.*, 21(5), 491-494

- Gurel, M., 2016, Antimicrobial Activities of Different Bioceramic Root Canal Sealers on Various Bacterial Species, *Int. J. Appl. Dent. Sci.*, 2, 19-22
- Guven Y, Tuna, E.B., Dincol, M.E., dan Aktoren, O., 2014, X-ray Diffraction Analysis of MTA-Plus, MTA-Angelus and DiaRoot BioAggregate, *Eur. J. Dent.*, 8, 211-215
- Ha, W.N., Nicholson, T., Kahler, B., dan Walsh, L.J., 2017, Mineral Trioxide Aggregate—A Review of Properties and Testing Methodologies, *Materials*, 10, 1-18
- Harikumar, P S. dan Aravind, A., 2016, Antibacterial Activity of Copper Nanoparticles and Copper Nanocomposites against Escherichia Coli Bacteria, *Int. J. Sci.*, 2(5), 83-90
- International Organization for Standardization, 2012, Dental Root Canal Sealing Materials, In International Standard ISO 6876:2012, 3rd ed.; ISO: Geneva, Switzerland, p. 9.
- International Organization for Standardization, 2007, Dentistry: Water-Based Cements, Part 1: Powder/liquid Acid-Base Cements, In International Standard ISO 9917-1:2007, 2nd ed.; ISO: Geneva, Switzerland, p. 23.
- Irianto, K., 2014, *Bakteriologi, Mikologi, dan Virologi*, Alfabeta, Bandung
- Irnawati, D., Agustiono, P., dan Wardhani, E.H., 2010, Pengaruh Konsentrasi Cu dalam Cu-Zeolit terhadap Daya Antibakteri Pada Streptococcus Mutans, *J. Zeolit Indonesia*, 2(9), 47-53
- Kaur, M., Singh, H., Dhillon, J.S., Batra, M., dan Saini, M., 2017, MTA versus Biodentine: Review of Literature with a Comparative Analysis, *JCDR*, 11(8), 1-5
- Khan, I., Saeed, K., dan Khan, I., 2017, Nanoparticles: Properties, Applications and Toxicities, *Arab. J. Chem.*, 12, 908-931
- Klein, S., Lorenzo, C., Hoffmann, S., Walther, J.M., Storbeck, S., Piekarski, T., Tindall, B.J., Wray, V., Nimtz, M., dan Moser, J., 2009, Adaptation of Pseudomonas Aeruginosa to Various Conditions Includes tRNA-Dependent Formation of Alanyl-Phosphatidylglycerol, *Mol. Microbiol.*, 71(3), 551-565

- Kouzmanova, Y. dan Dimitrova, I., 2020, Solubility of Calcium Based Cements – a Comparative Study, *Acta Medica Bulgarica*, 47(2), 27-29
- Kumala, Y.R., Rachmawati, D., dan Hersanto, K., 2017, Stimulasi Dentin Reparatif *Direct Pulp Capping* Menggunakan Ekstrak Ikan Teri (*Stolephorus sp*), *E-Prodenta J. Dent.*, 2(1), 1-9
- Li, M., Xiang, K., Luo, G., Gong, D., Shen, Q., dan Zhang, L., 2013, Preparation of Monodispersed Copper Nanoparticles by an Environmentally Friendly Chemical Reduction, *Chin. J. Chem.*, 31, 1285-1289
- Liu, S., Li, Q., dan Zhao, X., 2018, Hydration Kinetics of Composite Cementitious Materials Containing Copper Tailing Powder and Graphene Oxide, *Materials (Basel)*, 11(12), 2499-2514
- Lutsenko, S., Barnes, N.L., dan Bartee, M.Y., 2007, Function and Regulation of Human Copper-Transporting ATPases, *Physiological Reviews*, 87, 1011-1046
- Mahmoodi, S., Eimi, A., dan Nezhadi, S.H., 2018, Copper Nanoparticles as Antibacterial Agents, *J. Mol. Pharm. Org. Process Res.*, 6(1), 1-7
- Mamuru, S.A., John, S., Samuel, P., dan Edam. E., 2016, Spectrophotometric Evaluation of Biosynthesized Copper Nanoparticles using *Allium cepa*, *Azadirachta indica* and *Moringa oleifera* Plant Extracts, *ADSUJSR*, 4(2), 166-174
- Martinez, C.A., Nguyen, K.T., Ameer, F.S., dan Anker, J., 2017, Reactive Oxygen Species Generation by Copper(II) Oxide Nanoparticles Determined by DNA Damage Assays and EPR Spectroscopy, *Nanotoxicology*, 11(2), 1-40
- Moder, K., 2007, How to Keep The Type I Error Rate in Anova if Variances are Heteroscedastic, *Aust. J. Stat.*, 36(3), 179-188
- Mohammadi, Z., Giardino, L., Palazzi, F., dan Shalavi, S., 2012, Antibacterial Activity of A New Mineral Trioxide Aggregate-Based Root Canal Sealer, *Int. Dent. J.*, 62(2), 70–73
- Napitupulu, R.L.Y., Adhani, R., dan Erlita, I., 2019, Hubungan Perilaku Menyikat Gigi, Keasaman Air, Pelayanan Kesehatan Gigi terhadap Karies di Man 2 Batola, *Dentin J. Kedokt. Gigi*, 1(3), 17-22

- Nazari, A. dan Riahi, S., 2011, Effects of CuO Nanoparticles on Compressive Strength of Self-Compacting Concrete, *Sadhana IAS*, 3(36), 371-391
- Nazer, A., Paya, J., Borrachero, M.V., dan Monzo, J., 2016, Use of Ancient Copper Slags in Portland Cement and Alkali Activated Cement Matrices, *J. Environ. Manage.*, 167, 115-123
- Nurhidayati, S., Faturrahman, dan Ghazali, M., 2015, Deteksi Bakteri Patogen yang Berasosiasi dengan *Kappaphycus Alvarezii* (Doty) Bergejala Penyakit Ice-Ice, *J. Sains Teknol. Lingkungan*, 2(1), 24-30
- Park, M., Kim, K.Y., Seo, H., Cheon, Y.E., Koh, J.H., Sun, H., dan Kim, T.J., 2014, Practical Challenges Associated with Catalyst Development for The Commercialization of Li-air Batteries, *J. Electrochem. Sci. Technol.*, 5(1), 1-18
- Patel, N., Patel, K., Baba, S.M., Jaiswal, S., Venkataraghavan, K., dan Jani, M., 2014, Comparing Gray and White Mineral Trioxide Aggregate as a Repair Material for Furcation Perforation: An in Vitro Dye Extraction Study, *J. Clin. Diagn. Res.*, 8(10), 70-73
- Prasad, K., dan Naik, C. T., 2017, Mineral Trioxide Aggregate in Endodontics, *Inter J. Appl. Dent. Sci. Manipulation*, 3(1), 71-75
- Prathita, T., Djauharie, N.K., dan Meidyawati, R., 2019, Antimicrobial Activity of Mineral Trioxide Aggregate and Calcium Hydroxide Sealer on *Enterococcus Faecalis* Strain ATCC29212, *Int. J. App. Pharm*, 1(11), 123-125
- Pushpa, S., Maheshwari, C., Maheshwari, G., Sridevi, N., Duggal, P., dan Ahuja, P., 2018, Effect of pH on Solubility of White Mineral Trioxide Aggregate and Biodentine: An In Vitro Study, *JODDD*, 3(12), 201-207
- Putri, M.H., Sukini, dan Yodong, 2017, *Mikrobiologi*, Kementerian Kesehatan Republik Indonesia, Jakarta
- Qing-ming, L., De-bi, Z., Yamamoto, Y., Ichino, R., dan Okido, M., 2012, Preparation of Cu Nanoparticles with NaBH<sub>4</sub> by Aqueous Reduction Method, *Trans. Nonferrous Met. Soc. China*, 22, 117-123
- Rao, A., Rao, A., dan Shenoy, R., 2009, Mineral Trioxide Aggregate—A Review, *J. Clin. Pediatr. Dent.*, 34(1), 1-8

- Rieuwpassa, I.E., Yunus, M., dan Arsana, I.W.Y., 2011, Identifikasi *Pseudomonas aeruginosa* dan Tes Sensitivitas Siprofloksasin pada Abses Periodontal, *Dentofasial*, 3(10), 151-155
- Sachwiver, B., Surya, L.S., dan Elianora, D., 2018, Identifikasi Bakteri pada 3 Permukaan *Dental Unit (Bowl Rinse, Dental Chair, Instrument Table)* di RSGM Universitas Baiturrahmah Tahun 2018, *Jurnal B-Dent*, 1(5), 65-71
- Saghiri, M.A., Godoy, F.G., Asatourian, A., Lotfi, M., Banava, S., dan Boukani, K.K., 2013, Effect of pH on Compressive Strength of Some Modification of Mineral Trioxide Aggregate, *Med. Oral Patol Oral Cir Bucal*, 18(3), 714-720
- Saghiri, M.A., Kazerani, H., Morgano, dan S.M., Gutmann, J.L., 2020, Evaluation of Mechanical Activation and Chemical Synthesis for Particle Size Modification of White Mineral Trioxide Aggregate, *Eur Endod J.*, 5(2), 128-133
- Samiei, M., Aghazdeh, M., Lotfi, M., Shakoei, S., Aghazdeh, Z., dan Pakdel, S.M.V., 2013, Antimicrobial Efficacy of Mineral Trioxide Aggregate with and without Silver Nanoparticles, *IEJ*, 8(4), 166-170
- Salinas, S.G., Castillo, H.E., Arruebo, M., Mendoza, G., dan Irusta, S., 2018, Evaluation of the Antimicrobial Activity and Cytotoxicity of Different Components of Natural Origin Present in Essential Oils, *Molecules*, 23, 1-18
- Schmider, E., Ziegler, M., Danay, E., Beyer, L., dan Bühner, M., 2010, Is It Really Robust? Reinvestigating The Robustness of ANOVA Against Violations of The Normal Distribution Assumption, *Methodology*, 6, 147- 151
- Seethalakshmi, C., Reddy, R.C.J., Asifa, N., dan Prabhu, S., 2016, Correlation of Salivary pH, Incidence of Dental Caries and Periodontal Status in Diabetes Mellitus Patients: A Cross-sectional Study, *JCDR*, 10(3), 12-14
- Sidika, A.N., Zakaria, M.N., Artilia, I., Dewi, Z.Y., dan Cahyanto, A., 2020, Evaluation of Calcium Ion Release in Calcium Hydroxide Prototype as Intracanal Medicament, *J. Dentomaxillofac Sci.*, 2(5), 86-89
- Singh, A.P., Singh, N., dan Singh, A.P., 2020, Solubility : An Overview, *Int. J. Pharm. Chem. Anal.*, 7(4), 166-171

- Sipert, C.R., Hussne, R.P., dan Nishiyama, C.K., 2005, In Vitro Antimicrobial Activity Of Gill Canal, Sealapex, Mineral Trioxide Aggregate, Portland Cement, and Endorez, *Int. Endod. J.*, 38, 539–543
- Sobhnamayan, F., Adl, A., Shojaee, N.S., Shams, M.S., dan Zarghami, E., 2017, Compressive Strength of Mineral Trioxide Aggregate and Calcium-enriched Mixture Cement Mixed with Propylene Glycol, *IEJ*, 12(4), 493-496
- Soomro, R.A., Sherazi, S.T.H., Sirajuddin, Memon, N., Shah, M.R., Kalwar, N.H., Hallam, K.R., dan Shah, A., 2014, Synthesis of Air Stable Copper Nanoparticles and Their Use in Catalysis, *Adv. Mat. Lett.*, 5(4), 191-198
- Souza, F.C.P., Moraes, P.C., Garcia, L.F.R., Aguilar, F.G., dan Watanabe, E., 2013, Evaluation of PH, Calcium Ion Release and Antimicrobial Activity of A New Calcium Aluminate Cement, *Braz Oral Res.*, 27(4), 324-330
- Suprpto, Handoyo, C.A.H., Senja, P.A., Ramadhan, V.B., dan Ni'mah, Y.L., 2020, Synthesis of Copper Nanoparticles Using *Chromolaena odorata* (L.) Leaf Extract as A Stabilizing Agent, *Ind. J. Chem. Anal.*, 1(3), 9-16
- Suyono, Y. dan Salahudin, F., 2011, Identifikasi dan Karakterisasi Bakteri *Pseudomonas* pada Tanah yang Terindikasi Terkontaminasi Logam, *Jurnal Biopropal Industri*, 1(2), 8-13
- Tabassum, S. dan Khan, F.R., 2016, Failure of Endodontic Treatment : The Usual Suspects, *Eur. J. Dent.*, 10(1), 144-147
- Umer, A., Naveed, S., Ramzan, N., Rafique, M.S., dan Imran, M., 2014, A Green Method for The Synthesis of Copper Nanoparticles Using L-Ascorbic Acid, *Revista Materia*, 3(19), 197-203
- Usman, M.S., Zowalaty, M.E.E., Shameli, K., Zainuddin, N., Salama, M., dan Ibrahim, N.A., 2013, Synthesis, Characterization, and Antimicrobial Properties of Copper Nanoparticles, *Int. J. Nanomed.*, 8, 4467-4479
- Valero, A., Rodriguez, F.P., Carrasco, E., Alventosa, J.M.F., Gimeno, R.M.G., dan Zurera, G., 2009, Modelling The Growth Boundaries of *Staphylococcus Aureus*: Effect of Temperature, PH and Water Activity, *Int. J. Food Microbiol.*, 133(1-2), 186-194
- Wang, X., 2017, Effects of Nanoparticles on The Properties of Cement-Based Materials, *Thesis*, Civil Engineering Iowa State University, Iowa

- Wibowo, M.W.A., 2021, Penambahan Sifat Antibakteri Semen Mineral Trioxide Aggregate dengan Nanopartikel Perak, *Tesis*, Program Studi Magister Kimia Departemen Kimia Universitas Gadjah Mada, Yogyakarta
- Xiong, J., Wang, Y., Xue, Q., dan Wu, X., 2011, Synthesis of Highly Stable Dispersions of Nanosized Copper Particles Using L-Ascorbic Acid, *Green Chem.*, 13, 900-904
- Yadav, L., Tripathi, R.M., Prasad, R., Pudake, R.N., dan Mittal, J., 2017, Antibacterial Activity of Cu Nanoparticles against *E. coli*, *Staphylococcus aureus* and *Pseudomonas aeruginosa*, *Nano Biomed. Eng.*, 1(9), 9-14
- Yamin, I.F., dan Natsir, N., 2014, Bakteri Dominan di Saluran Akar Gigi Nekrosis, *Dentofasial*, 2(13), 113-116
- Yavari, H.R., Borna, Z., Rahimi, S., Shahi, S., Valizadeh, H., dan Ghojazadeh, M., 2013, Placement in an Acidic Environment Increase The Solubility of White Mineral Trioxide Aggregate, *J. Conserv. Dent.*, 16(3), 257-260
- Zeid, S.T.H.A., Alothmani, O.S., dan Yousef, M.K., 2015, Biodentine and Mineral Trioxide Aggregate : An Analysis of Solubility, pH Changes, and Leaching Element, *Life Sci. J.*, 12(4), 18-23