

## DAFTAR PUSTAKA

- Abd Mutalib, M., Rahman, M. A., Othman, M. H. D., Ismail, A. F., & Jaafar, J. (2017). Scanning Electron Microscopy (SEM) and Energy-Dispersive X-Ray (EDX) Spectroscopy. In *Membrane Characterization*. Elsevier B.V. <https://doi.org/10.1016/B978-0-444-63776-5.00009-7>
- Abdullah, A., & Mohammed, A. (2019). Scanning Electron Microscopy ( SEM ): A Review Scanning Electron Microscopy ( SEM ): A Review. *Proceedings of 2018 International Conference on Hydraulics and Pneumatics - HERVEX, January*, 77–85.
- Abdullah, M., & Khairurrijal, K. (2009). Review: Karakterisasi Nanomaterial. *J. Nano Saintek*, 2(1), 1–9.
- Adinew, B. (2014). GC-MS and FT-IR analysis of constituents of essential oil from Cinnamon bark growing in South-west of Ethiopia. ~ 75 ~ *International Journal of Herbal Medicine*, 1(6), 22–31.
- Almukarrama, & Yusuf, Y. (2019). Development Carbonated Hydroxyapatite Powders from Oyster Shells (*Crassostrea gigas*) by Sintering Time Controlling. *{IOP} Conference Series: Materials Science and Engineering*, 546(4), 42001. <https://doi.org/10.1088/1757-899x/546/4/042001>
- Aminatun, Indriani, Y., & Hikmawati, D. (2019). Fabrication of chitosan-chondroitin sulfate/hydroxyapatite composite scaffold by freeze drying method. *Journal of International Dental and Medical Research*, 4, 1355–1362.
- Anggraini, R. M., Supii, A. I., Suparta, G. B., & Yusuf, Y. (2019). The effect of ph on the characteristics of carbonate hydroxyapatite based on pearl shell (*Pinctada maxima*). *Key Engineering Materials*, 818 KEM, 44–49.

<https://doi.org/10.4028/www.scientific.net/KEM.818.44>

- Apriliani, N. F., Baqiya, M. a, & Darminto. (2012). Pengaruh Penambahan Larutan MgCl<sub>2</sub> pada Sintesis Kalsium Karbonat Presipitat Berbahan Dasar Batu Kapur dengan Metode Karbonasi. *Sains Dan Seni ITS*, 1(1), B30–B34. <https://doi.org/http://dx.doi.org/10.12962/j23373520.v1i1.343>
- Aziz, M. (2010). Batu Kapur Dan Peningkatan Nilai Tambah Serta Spesifikasi Untuk Industri. *Jurnal Teknologi Mineral Dan Batubara*, 06(3), 116–131.
- Balamurugan, A., Michel, J., Fauré, J., Benhayoune, H., Wortham, L., Sockalingum, G., Banchet, V., Bouthors, S., Laurent-Maquin, D., & Balossier, G. (2006). Synthesis and structural analysis of SOL gel derived stoichiometric monophasic hydroxyapatite. *Ceramics - Silikaty*, 50(1), 27–31.
- Balouiri, M., Sadiki, M., & Ibnsouda, S. K. (2016). Methods for in vitro evaluating antimicrobial activity: A review. *Journal of Pharmaceutical Analysis*, 6(2), 71–79. <https://doi.org/10.1016/j.jpha.2015.11.005>
- Bunaciu, A. A., Udriștioiu, E. gabriela, & Aboul-Enein, H. Y. (2015). X-Ray Diffraction: Instrumentation and Applications. *Critical Reviews in Analytical Chemistry*, 45(4), 289–299. <https://doi.org/10.1080/10408347.2014.949616>
- C. Mauli Agrawal, Joo L. Ong, M. R. A. and G. M. (2014). Introduction to Biomaterials: Basic Theory with Engineering Applications. *Cambridge University Press*.
- Chang, L. L. Y., Howe, R. A., & Zussman, J. (1996). *Non- silicates: Sulphates, Carbonates, Phosphates, Halides*. 383 pp. Longman, Harlow, Essex.
- Chaudhry, A. S. K. A. A. (2020). Handbook Of Ionic Substituted Hydroxyapatites. In *Woodhead Publishing* (Vol. 59). Mathew Deans.
- Chung, S., & Webster, T. J. (2016). 17 - Antimicrobial nanostructured polyurethane scaffolds. *Advances in Polyurethane Biomaterials*, 503–521. <https://doi.org/10.1016/B978-0-08-100614-6.00017-2>

- Comodi, P., Liu, Y., Zanazzi, P. F., & Montagnoli, M. (2001). Structural and vibrational behaviour of fluorapatite with pressure. Part I: In situ single-crystal X-ray diffraction investigation. *Physics and Chemistry of Minerals*, 28(4), 219–224. <https://doi.org/10.1007/s002690100154>
- Fatimah, S., Ragadhita, R., Husaeni, D. F. Al, & Nandiyanto, A. B. D. (2021). How to Calculate Crystallite Size from X-Ray Diffraction (XRD) using Scherrer Method. *ASEAN Journal of Science and Engineering*, 2(1), 65–76. <https://doi.org/10.17509/ajse.v2i1.37647>
- Ferraz, M. P., Monteiro, F. J., & Manuel, C. M. (2004). Hydroxyapatite nanoparticles: A review of preparation methodologies. *Journal of Applied Biomaterials & Biomechanics : JABB*, 2(2), 74–80.
- Fiume, E., Magnaterra, G., Rahdar, A., Verné, E., & Baino, F. (2021). Hydroxyapatite for biomedical applications: A short overview. *Ceramics*, 4(4), 542–563. <https://doi.org/10.3390/ceramics4040039>
- Gajic, I., Kabic, J., Kekic, D., Jovicevic, M., Milenkovic, M., Mitic Culafic, D., Trudic, A., Ranin, L., & Opavski, N. (2022). Antimicrobial Susceptibility Testing: A Comprehensive Review of Currently Used Methods. *Antibiotics (Basel, Switzerland)*, 11(4). <https://doi.org/10.3390/antibiotics11040427>
- García, L. A., & Díaz, M. (2011). Cleaning in Place. In *Comprehensive Biotechnology, Second Edition* (Second Edi, Vol. 2). Elsevier B.V. <https://doi.org/10.1016/B978-0-08-088504-9.00447-5>
- Guilinger, T. R., Schechter, R. S., & Lake, L. W. (1987). Kinetic Study of Pyrite Oxidation in Basic Carbonate Solutions. *Industrial and Engineering Chemistry Research*, 26(4), 824–830. <https://doi.org/10.1021/ie00064a035>
- Gunawan, A., Anggraini Pangestu, A., Rahmayanti, E., A.I. Saputra, A., Wahyu Setyo Rini, I. D., Zulfikar, A., & Arobi, A. I. (2022). Pengaruh Penambahan H<sub>2</sub>O<sub>2</sub> sebagai Foaming Agent pada Karakteristik Batu Bata Ringan Tahan Api Berbahan

- Dasar Fireclay dan Fly Ash PLTU Teluk Balikpapan. *SPECTA Journal of Technology*, 6(1), 18–24. <https://doi.org/10.35718/specta.v6i1.390>
- Habibie, S., Santosa Wargadipura, A. H., Gustiono, D., Herdianto, N., Riswoko, A., Nikmatin, S., & Clarke, S. (2017). Production and Characterization of Hydroxyapatite Bone Substitute Material Performed from Indonesian Limestone. *International Journal of Biomedical Engineering and Science*, 4(1), 11–23. <https://doi.org/10.5121/ijbes.2017.4102>
- Hakim, L., Dirgantara, M., & Nawir, M. (2019). Karakterisasi Struktur Material Pasir Bongkahan Galian Golongan C Dengan Menggunakan X-Ray Diffraction (X-RD) Di Kota Palangkaraya. *Jurnal Jejaring Matematika Dan Sains*, 1(1), 44–51. <https://doi.org/10.36873/jjms.v1i1.136>
- Hench, L. L., Splinter, R. J., Allen, W. C., & Greenlee, T. K. (1971). Bonding mechanisms at the interface of ceramic prosthetic materials. *Journal of Biomedical Materials Research*, 5(6), 117–141. <https://doi.org/10.1002/jbm.820050611>
- Hidayat, M. Z. I. R. S. A. T. N. (2015). Gradualisme Struktur Kristal dan Sifat Mekanik Material Fungsional Kalsit-Mg / Al Hasil Fabrikasi dengan Metode Infiltrasi. *SEMINAR NASIONAL FISIKA DAN PEMBELAJARANNYA, October 2016*.
- Jamarun, N., Azharman, Z., Zilfa, & Septiani, U. (2016). Effect of firing for synthesis of hydroxyapatite by precipitation method. *Oriental Journal of Chemistry*, 32(4), 2095–2099. <https://doi.org/10.13005/ojc/320437>
- Januariyasa, I. K., & Yusuf, Y. (2020). Porous carbonated hydroxyapatite-based scaffold using simple gas foaming method. *Journal of Asian Ceramic Societies*, 8(3), 634–641. <https://doi.org/10.1080/21870764.2020.1770938>
- Kania, N., Widowati, W., Dewi, F. R. P., Christianto, A., Setiawan, B., Budhiparama, N., & Noor, Z. (2018). Cinnamomum burmanini Blume increases bone turnover marker and induces tibia's granule formation in ovariectomized rats. *Journal of*

- Ayurveda and Integrative Medicine*, 9(1), 20–26.  
<https://doi.org/10.1016/j.jaim.2017.01.005>
- Lee, J., Cuddihy, M. J., & Kotov, N. A. (2008). Three-Dimensional Cell Culture Matrices: State of the Art. *TISSUE ENGINEERING: Part B*, 14(1).  
<https://doi.org/10.1089/teb.2007.0150>
- Li, Y. Q., Kong, D. X., & Wu, H. (2013). Analysis and evaluation of essential oil components of cinnamon barks using GC-MS and FTIR spectroscopy. *Industrial Crops and Products*, 41(1), 269–278.  
<https://doi.org/10.1016/j.indcrop.2012.04.056>
- Lixourgioti, P., Goggin, K. A., Zhao, X., Murphy, D. J., van Ruth, S., & Koidis, A. (2022). Authentication of cinnamon spice samples using FT-IR spectroscopy and chemometric classification. *Lwt*, 154. <https://doi.org/10.1016/j.lwt.2021.112760>
- Malau, N. D., & Adinugraha, F. (2020). Synthesis of hydrokxyapatite based duck egg shells using precipitation method. *Journal of Physics: Conference Series*, 1563(1).  
<https://doi.org/10.1088/1742-6596/1563/1/012020>
- Masters, E. A., Ricciardi, B. F., Bentley, K. L. d. M., Moriarty, T. F., Schwarz, E. M., & Muthukrishnan, G. (2022). Skeletal infections: microbial pathogenesis, immunity and clinical management. *Nature Reviews Microbiology*, 20(7), 385–400. <https://doi.org/10.1038/s41579-022-00686-0>
- Mbaveng, A. T., & Kuete, V. (2017). Cinnamon Species. In *Medicinal Spices and Vegetables from Africa: Therapeutic Potential Against Metabolic, Inflammatory, Infectious and Systemic Diseases*. Elsevier Inc. <https://doi.org/10.1016/B978-0-12-809286-6.00017-0>
- Miculescu, F., Maidaniuc, A., Miculescu, M., Dan Batalu, N., Catalin Ciocoiu, R., Voicu, Ș. I., Stan, G. E., & Thakur, V. K. (2018). Synthesis and Characterization of Jellified Composites from Bovine Bone-Derived Hydroxyapatite and Starch as Precursors for Robocasting. *ACS Omega*, 3(1), 1338–1349.

<https://doi.org/10.1021/acsomega.7b01855>

- Milla, L. El, Indrani, D. J., Ilmu, D., Kedokteran, M., Gigi, F. K., Brawijaya, U., Ilmu, D., Kedokteran, M., Gigi, F. K., & Indonesia, U. (2016). Hidroksiapatit , alginat dan kitosan sebagai bahan scaffold tulang: studi spektroskopi. *Dentika Dental Journal*, 19(2), 93–97.
- Mishra, V. K., Bhattacharjee, B. N., Kumar, D., Rai, S. B., & Parkash, O. (2016). Effect of a chelating agent at different pH on the spectroscopic and structural properties of microwave derived hydroxyapatite nanoparticles: A bone mimetic material. *New Journal of Chemistry*, 40(6), 5432–5441. <https://doi.org/10.1039/c5nj03322e>
- Mohamed, M. A., Jaafar, J., Ismail, A. F., Othman, M. H. D., & Rahman, M. A. (2017). Fourier Transform Infrared (FTIR) Spectroscopy. In *Membrane Characterization*. Elsevier B.V. <https://doi.org/10.1016/B978-0-444-63776-5.00001-2>
- Mohd Pu'ad, N. A. S., Koshy, P., Abdullah, H. Z., Idris, M. I., & Lee, T. C. (2019). Syntheses of hydroxyapatite from natural sources. *Heliyon*, 5(5), e01588. <https://doi.org/10.1016/j.heliyon.2019.e01588>
- Mulazzi, M., Campodoni, E., Bassi, G., Montesi, M., Panseri, S., Bonvicini, F., Gentilomi, G. A., Tampieri, A., & Sandri, M. (2021). Medicated hydroxyapatite/collagen hybrid scaffolds for bone regeneration and local antimicrobial therapy to prevent bone infections. *Pharmaceutics*, 13(7). <https://doi.org/10.3390/pharmaceutics13071090>
- Munasir, M., Triwikantoro, T., Zainuri, M., & Darminto, D. (2012). UJI XRD DAN XRF PADA BAHAN MENERAL (BATUAN DAN PASIR) SEBAGAI SUMBER MATERIAL CERDAS (CaCO<sub>3</sub> DAN SiO<sub>2</sub>). *Jurnal Penelitian Fisika Dan Aplikasinya (JPFA)*, 2(1), 20. <https://doi.org/10.26740/jpfa.v2n1.p20-29>
- Mutalib, M. A., Rahman, M. A., Othman, M. H. D., Ismail, A. F., & Jaafar, J. (2017). *Scanning Electron Microscopy (SEM) and Energy-Dispersive X-Ray (EDX) Spectroscopy*.

- Myer Kutz. (1995). Engineering and design. *Current Opinion in Structural Biology*, 5(4), 557–568. [https://doi.org/10.1016/0959-440x\(95\)80044-1](https://doi.org/10.1016/0959-440x(95)80044-1)
- Nayak, A. K., Bhattacharya, A., & Sen, K. K. (2010). Hydroxyapatite-antibiotic implantable minipellets for bacterial bone infections using precipitation technique: preparation, characterization and in-vitro antibiotic release studies. *J. Pharm. Res*, 3(1), 53–59.
- Nurhayati, Muhdarina, Amilia Linggawati, Sofia Anita, and T. A. A. (2016). Preparation and Characterization of Calcium Oxide Heterogeneous Catalyst Derived from Anadara Granosa Shell for Biodiesel Synthesis. *KnE Engineering*, 1(2015), 1–8. <https://doi.org/10.18502/keg.v1i1.494>
- Oates, J. A. H. (1998). Lime und Limestone. *Chemie Ingenieur Technik - CIT*, 71(8). <https://doi.org/10.1002/cite.330710828>
- Pandey, A., Sharma, R. K., & Balani, K. (2015). Introduction to Biomaterials. *Biosurfaces: A Materials Science and Engineering Perspective*, 1–64. <https://doi.org/10.1002/9781118950623.ch1>
- Patty, D. J., Nugraheni, A. D., Ana, I. D., & Yusuf, Y. (2022). Dual functional carbonate-hydroxyapatite nanocomposite from Pinctada maxima and egg-white for bone tissue engineering. *Journal of Biomaterials Science, Polymer Edition*, 33(8), 1043–1062. <https://doi.org/10.1080/09205063.2022.2036934>
- Pawarangan, I., & Yusuf, Y. (2018). Characteristics of hydroxyapatite from buffalo bone waste synthesized by precipitation method. *IOP Conference Series: Materials Science and Engineering*, 432(1). <https://doi.org/10.1088/1757-899X/432/1/012044>
- Permadi, R., Rachwibowo, P., & Krisna Hidayat, W. (2014). Universitas Diponegoro Potensi Situs-Situs Warisan Geologi Di Area Kars Gunung Sewu Sebagai Pendukung Dan Peluang Pengembangan Geopark Di Indonesia Program Studi Teknik Geologi Semarang Oktober 2014. *Jurnal Teknik Geologi*, 1, 1–14.



- Pham, D., Lyczko, N., Sebei, H., Nzihou, A., & Sharrock, P. (2012). *Synthesis of calcium hydroxyapatite from calcium carbonate and different orthophosphate sources : A comparative study*. 177, 1080–1089.
- Pharma, D., Jamarun, N., Elfina, S., Arief, S., & Djamaan, A. (2016). *Hydroxyapatite Material: Synthesis by Using Precipitation Method from Limestone*. 8(13), 302–306.
- Pirmoradian, M., & Hooshmand, T. (2019). Remineralization and antibacterial capabilities of resin-based dental nanocomposites. In *Applications of Nanocomposite Materials in Dentistry*. Elsevier Inc. <https://doi.org/10.1016/B978-0-12-813742-0.00015-8>
- Poursamar, S. A., Hatami, J., Lehner, A. N., Cláudia, L., Castelo, F., & Antunes, A. P. M. (2015). Gelatin porous scaffolds fabricated using a modified gas foaming technique : Characterisation and cytotoxicity assessment. *Materials Science & Engineering C*, 48, 63–70. <https://doi.org/10.1016/j.msec.2014.10.074>
- Prabuseenivasan, S., Jayakumar, M., & Ignacimuthu, S. (2006). In vitro antibacterial activity of some plant essential oils. *BMC Complementary and Alternative Medicine*, 6, 1–8. <https://doi.org/10.1186/1472-6882-6-39>
- Prayitno, A. H., Prasetyo, B., & Sutirtoadi, A. (2020). Synthesis and characteristics of nano calcium oxide from duck eggshells by precipitation method. *IOP Conference Series: Earth and Environmental Science*, 411(1). <https://doi.org/10.1088/1755-1315/411/1/012033>
- Ratnayake, J. T. B., Mucalo, M., & Dias, G. J. (2017). Substituted hydroxyapatites for bone regeneration: A review of current trends. *Journal of Biomedical Materials Research - Part B Applied Biomaterials*, 105(5), 1285–1299. <https://doi.org/10.1002/jbm.b.33651>
- Regish, K. M., Sharma, D., & Prithviraj, D. R. (2013). An Overview of Immediate Root Analogue. *Journal of Oral Implantology*, 225–233.



<https://doi.org/10.1563/AAID-JOI-D-10-00208>

Rincon-Lopez, J. A., Hermann-Muñoz, J. A., Giraldo-Betancur, A. L., De Vizcaya-Ruiz, A., Alvarado-Orozco, J. M., & Muñoz-Saldaña, J. (2018). Synthetic and Bovine-Derived Hydroxyapatite Ceramics : A Comparison. *Materials*, 11(333), 17. <https://doi.org/10.3390/ma11020333>

Sari, M., & Yusuf, Y. (2018). Synthesis and characterization of hydroxyapatite based on green mussel shells (*Perna viridis*) with the variation of stirring time using the precipitation method. *{IOP} Conference Series: Materials Science and Engineering*, 432, 12046. <https://doi.org/10.1088/1757-899x/432/1/012046>

Sharma, S. K., Verma, D. S., Khan, L. U., Kumar, S., & Khan, S. B. (2018). Handbook of Materials Characterization. In *Handbook of Materials Characterization*. <https://doi.org/10.1007/978-3-319-92955-2>

Shi, D. (2006). *Introduction to biomaterials*. 清华大学出版社有限公司.

Shi, F., Xiao, D., Zhang, C., Zhi, W., Liu, Y., & Weng, J. (2021). The effect of macropore size of hydroxyapatite scaffold on the osteogenic differentiation of bone mesenchymal stem cells under perfusion culture. *Regenerative Biomaterials*, 8(6), 1–12. <https://doi.org/10.1093/rb/rbab050>

Sirait, M., Sinulingga, K., Siregar, N., Doloksaribu, M. E., & Amelia. (2022). Characterization of hydroxyapatite by cytotoxicity test and bending test. *Journal of Physics: Conference Series*, 2193(1). <https://doi.org/10.1088/1742-6596/2193/1/012039>

Sirait, M., Sinulingga, K., Siregar, N., & Siregar, R. S. D. (2020). Synthesis of hydroxyapatite from limestone by using precipitation method. *Journal of Physics: Conference Series*, 1462(1). <https://doi.org/10.1088/1742-6596/1462/1/012058>

Sukojo, B. M., & Ramdhani, R. (2019). Mapping the Potential and Quality of Limestone Rocks Using Remote Sensing Method (Study Case: Semanding, Sub

- District Tuban). *IPTEK Journal of Proceedings Series*, 0(2), 16.  
<https://doi.org/10.12962/j23546026.y2019i2.5299>
- Ullah, H., & Ali, S. (2017). Classification of Anti-Bacterial Agents and Their Functions. *Antibacterial Agents*. <https://doi.org/10.5772/intechopen.68695>
- Verma, S., Patel, A. K., Fatma, B., Rajesh, P. S. M., Singh, V., Verma, V., & Balani, K. (2015). Applications of Biomaterials. *Biosurfaces: A Materials Science and Engineering Perspective*, 284–317. <https://doi.org/10.1002/9781118950623.ch10>
- Winastri, N. L. A. P., Muliasari, H., & Hidayati, E. (2020). AKTIVITAS ANTIBAKTERI AIR PERASAN DAN REBUSAN DAUN CALINCING (*Oxalis corniculata* L.) TERHADAP *Streptococcus mutans*. *Berita Biologi*, 19(2). <https://doi.org/10.14203/beritabiologi.v19i2.3786>
- Wińska, K., Mączka, W., Łyczko, J., Grabarczyk, M., Czubaszek, A., & Szumny, A. (2019). Essential oils as antimicrobial agents—myth or real. Wińska K, Mączka W, Łyczko J, Grabarczyk M, Czubaszek A, Szumny A. Essential oils as antimicrobial agents—myth or real alternative? *Molecules*. 2019;24(11):1–21. <https://doi.org/10.1016/j.bioactmat.2019.11.002>
- Xu, Y., Chen, C., Hellwarth, P. B., & Bao, X. (2019). Biomaterials for stem cell engineering and biomanufacturing. *Bioactive Materials*, 4(July), 366–379. <https://doi.org/10.1016/j.bioactmat.2019.11.002>
- Yusuf, Y., Khasanah, D.U., Syafaat, F.Y., Pawarangan, I., Sari, M., Mawuntu, V. J., & dan Rizkayanti, Y. (2019). *HIDROKSIAPATIT BERBAHAN DASAR BIOGENIK*. UGM PRESS.
- Yusuf, Y. (2021). *KARBONAT HIDROKSIAPATIT DARI BAHAN ALAM: Pengertian, Karakterisasi, dan Aplikasi*. UGM PRESS.
- Zhang, K., Wang, S., Li, C., Sun, H., & Zhang, Y. (2023). Decomposition Mechanism and Calcination Properties of Small-Sized Limestone at Steelmaking Temperature. *Processes*, 11(4). <https://doi.org/10.3390/pr11041008>

