

DAFTAR PUSTAKA

- Abdulhameed, A., Mbuvi, H. M., Changamu, E. O. and Maingi, F. M. 2019. Microwave synthesis of carboxymethylcellulose (CMC) from Rice Husk. *IOSR Journal of Applied Chemistry (IOSR-JAC)*, **12**, 33-42.
- Abou Taleb, M. F., Abd El-Mohdy, H. and Abd El-Rehim, H. 2009. Radiation preparation of PVA/CMC copolymers and their application in removal of dyes. *Journal of hazardous materials*, **168**, 68-75.
- Akbulut, O., Taniguchi, I., Kumar, S., Shao-Horn, Y. and Mayes, A. M. 2007. Conductivity hysteresis in polymer electrolytes incorporating poly (tetrahydrofuran). *Electrochimica Acta*, **52**, 1983-1989.
- Akhlaq, M., Mushtaq, U., Naz, S. and Uroos, M. 2023. Carboxymethyl cellulose-based materials as an alternative source for sustainable electrochemical devices: a review. *RSC advances*, **13**, 5723-5743.
- Al-Muntaser, A., Pashameah, R. A., Sharma, K., Alzahrani, E., Farea, M. and Morsi, M. 2022. α -MoO₃ nanobelts/CMC-PVA nanocomposites: hybrid materials for optoelectronic and dielectric applications. *Journal of Polymer Research*, **29**, 274.
- Alabi, F., Lajide, L., Ajayi, O., Adebayo, A., Emmanuel, S. and Fadeyi, A. 2020. Synthesis and characterization of carboxymethyl cellulose from *Musa paradisiaca* and *Tithonia diversifolia*. *African Journal of Pure and Applied Chemistry*, **14**, 9-23.
- Aruldass, S., Mathivanan, V., Mohamed, A. and Tye, C. 2019. Factors affecting hydrolysis of polyvinyl acetate to polyvinyl alcohol. *Journal of Environmental Chemical Engineering*, **7**, 103238.
- Asmoro, N. W., Afriyanti, A. and Ismawati, I. 2018. Ekstraksi selulosa batang tanaman jagung (*zea mays*) metode basa. *Jurnal Ilmiah Teknosains*, **4**, 24-28.
- Bósquez-Cáceres, M. F., Bejar, J., Álvarez-Contreras, L. and Tafur, J. P. 2023. Enhancing Electrochemical Performance of Zinc-Air Batteries Using Freeze Crosslinked Carboxymethylcellulose-Chitosan Hydrogels as Electrolytes. *Journal of The Electrochemical Society*, **170**, 060502.
- Brza, M., Aziz, S. B., Raza Saeed, S., Hamsan, M. H., Majid, S. R., Abdulwahid, R. T., Kadir, M. F. and Abdullah, R. M. 2020. Energy storage behavior of lithium-ion conducting poly (vinyl alcohol)(PVA): Chitosan (CS)-based polymer blend electrolyte membranes: Preparation, equivalent circuit modeling, ion transport parameters, and dielectric properties. *Membranes*, **10**, 381.
- Candido, R. and Gonçalves, A. 2016. Synthesis of cellulose acetate and carboxymethylcellulose from sugarcane straw. *Carbohydrate polymers*, **152**, 679-686.
- Chakka, V. P. and Zhou, T. 2020. Carboxymethylation of polysaccharides: Synthesis and bioactivities. *International Journal of Biological Macromolecules*, **165**, 2425-2431.

- Darmawan, D. A., Yulianti, E., Sabrina, Q., Ishida, K., Sakti, A. W., Nakai, H., Pramono, E.andNdruru, S. T. C. L. 2024. Fabrication of solid polymer electrolyte based on carboxymethyl cellulose complexed with lithium acetate salt as Lithium-ion battery separator. *Polymer Composites*, **45**, 2032-2049.
- Dos Santos, D. M., De Lacerda Bukzem, A., Ascheri, D. P. R., Signini, R.andDe Aquino, G. L. B. 2015. Microwave-assisted carboxymethylation of cellulose extracted from brewer's spent grain. *Carbohydrate polymers*, **131**, 125-133.
- El-Naggar, A., Heiba, Z. K., Mohamed, M. B., Kamal, A., Lakshminarayana, G.andAbd-Elkader, O. H. 2022. Effect of MnS/ZnS nanocomposite on the structural, linear and nonlinear optical properties of PVA/CMC blended polymer. *Optical Materials*, **128**, 112379.
- Fabiani, V. A., Putri, M. A.andLestari, I. 2021. ANALISIS KONDUKTIVITAS DAN TERMAL PADA POLIMER ELEKTROLIT DARI KITOSAN/PVA/GLISEROL/LICIO4 UNTUK APLIKASI BATERAI ION LITIUM. *CHEMISTRY PROGRESS*, **14**.
- Feng, C., Zhu, J., Cao, L., Yan, L., Qin, C., Liang, C.andYao, S. 2022. Acidolysis mechanism of lignin from bagasse during p-toluenesulfonic acid treatment. *Industrial Crops and Products*, **176**, 114374.
- Fu, Y., Yang, L., Zhang, M., Lin, Z.andShen, Z. 2022. Recent advances in cellulose-based polymer electrolytes. *Cellulose*, **29**, 8997-9034.
- Galiwango, E., Rahman, N. S. A., Al-Marzouqi, A. H., Abu-Omar, M. M.andKhaleel, A. A. 2019. Isolation and characterization of cellulose and α -cellulose from date palm biomass waste. *Heliyon*, **5**.
- Gulati, K., Lal, S.andArora, S. 2019. Synthesis and characterization of PVA/Starch/CMC composite films reinforced with walnut (*Juglans regia L.*) shell flour. *SN Applied Sciences*, **1**, 1-12.
- Gupta, S.andVarshney, P. K. 2017. Effect of plasticizer concentration on structural and electrical properties of hydroxyethyl cellulose (HEC)-based polymer electrolyte. *Ionics*, **23**, 1613-1617.
- Habibah, R., Nasution, D. Y.andMuis, Y. 2013. Penentuan Berat Molekul dan Derajat Polimerisasi α -Selulosa yang Berasal Dari Alang-Alang. *Imperata cylindrical*.
- Hamsan, M., Aziz, S. B., Azha, M., Azli, A., Shukur, M., Yusof, Y. M., Muzakir, S. K., Manan, N. S.andKadir, M. F. Z. 2020. Solid-state double layer capacitors and protonic cell fabricated with dextran from Leuconostoc mesenteroides based green polymer electrolyte. *Materials Chemistry and Physics*, **241**, 122290.
- Haslinger, S., Hietala, S., Hummel, M., Maunu, S. L.andSixta, H. 2019. Solid-state NMR method for the quantification of cellulose and polyester in textile blends. *Carbohydrate polymers*, **207**, 11-16.
- Herawati, N., Defo, U. R.andAtikah 2019. Pengaruh Jenis Katalis Asam dan Waktu Fermentasi Terhadap% Yield Bioetenol dari Rumput Gajah. *Sumber*, **1**, 1-17.

- Hidayat, N., Wahyuni, N.andIrsan, R. 2014. Pemanfaatan Serbuk Pelepas Nipah (*Nypa Fruticans*) Untuk Desalinasi Di Muara Sungai Kakap. *Jurnal Online Mahasiswa Fakultas Teknik UNTAN*.
- Hikmawansyah, Y. 2015. *Sintesis Ni-ZIF-8 dengan Pelarut Air pada Suhu Kamar*. Institut Teknologi Sepuluh Nopember.
- Huang, Y., Meng, F., Liu, R., Yu, Y.andYu, W. 2019. Morphology and supramolecular structure characterization of cellulose isolated from heat-treated moso bamboo. *Cellulose*, **26**, 7067-7078.
- Ikhsan, A. N., Azmiati, Y., Delvianti, U.andSyauqiah, I. 2021. Karakteristik Biosorben Pelepas Nipah (*Nypa Fruticans*) Untuk Penurunan Kadar Logam Berat Air Merkuri (Hg). *Jukung (Jurnal Teknik Lingkungan)*, **7**.
- Irfan, M., Manjunath, A., Mahesh, S., Somashekhar, R.andDemappa, T. 2021. Influence of NaF salt doping on electrical and optical properties of PVA/PVP polymer blend electrolyte films for battery application. *Journal of Materials Science: Materials in Electronics*, **32**, 5520-5537.
- Jabbar, L., Bongiovanni, R., Chaussy, D., Gerbaldi, C.andBeneventi, D. 2013. Cellulose-based Li-ion batteries: a review. *Cellulose*, **20**, 1523-1545.
- Jinisha, B., Anilkumar, K., Manoj, M., Pradeep, V.andJayalekshmi, S. 2017. Development of a novel type of solid polymer electrolyte for solid state lithium battery applications based on lithium enriched poly (ethylene oxide)(PEO)/poly (vinyl pyrrolidone)(PVP) blend polymer. *Electrochimica Acta*, **235**, 210-222.
- Kasrawati, K., Sihotang, S. H.andMu'alim, A. 2023. Penentuan Berat Molekul dan Derajat Polimerisasi Selulosa yang Berasal dari Tongkol Jagung (*Zea mays* L) dengan Metode Viskositas. *Jurnal Serambi Akademica*, **11**, 527-534.
- Masrullita, M., Nurlaila, R., Zulmiardi, Z., Safrowardy, F., Auliani, A.andMeriatna, M. 2022. Synthesis Carboxyl Methyl Cellulose (CMC) from Rice Straw (*Oryza Sativa* L.) Waste. *International Journal of Engineering, Science and Information Technology*, **2**, 24-29.
- Mazuki, N., Majeed, A. A., Nagao, Y.andSamsudin, A. 2020. Studies on ionics conduction properties of modification CMC-PVA based polymer blend electrolytes via impedance approach. *Polymer testing*, **81**, 106234.
- Md Salim, R., Asik, J.andSarjadi, M. S. 2021. Chemical functional groups of extractives, cellulose and lignin extracted from native Leucaena leucocephala bark. *Wood Science and Technology*, **55**, 295-313.
- Mindemark, J., Sun, B., Törmä, E.andBrandell, D. 2015. High-performance solid polymer electrolytes for lithium batteries operational at ambient temperature. *Journal of Power Sources*, **298**, 166-170.
- Moussa, I., Khiari, R., Moussa, A., Belgacem, M. N.andMhenni, M. F. 2019. Preparation and characterization of carboxymethyl cellulose with a high degree of substitution from agricultural wastes. *Fibers and Polymers*, **20**, 933-943.

- Natsir, R. 2013. *Hubungan Salinitas Perairan dengan Kuantitas Bioetanol yang Dihasilkan oleh Nipah (Nypa fruticans) pada Berbagai Metode*. Universitas Hassanuddin.
- Ndruru, S., Wahyuningrum, D., Bundjali, B.andArcana, I. 2019. Green simple microwave-assisted extraction (MAE) of cellulose from Theobroma cacao L.(TCL) husk. *Materials Science and Engineering*, **541**, 012017.
- Ndruru, S. T. C. L., Rachmadhanti, E. N., Fridarima, S., Berghuis, N. T., Prasetyo, R., Yulianti, E., Hayati, A. T., Adriana, R., Siregar, R. A.andSofyan, M. I. 2024a. Molecular Vibration and Physicochemical Performance of Proton-Conducting Solid Polymer Electrolyte Membrane based on CMC/PVA/CH₃COONH₄. *Molekul*, **19**, 489-502.
- Ndruru, S. T. C. L., Syamsaizar, A. D., Hermanto, S., Sitanggang, B. C., Tawa, B. D., Kareem, A. A., Hayati, A. T., Ramadholi, B. F., Sofyan, M. I.andAnnas, D. 2024b. Synthesis of carboxymethyl cellulose from coconut fibers and its application as solid polymer electrolyte membranes. *Journal of Applied Polymer Science*, **141**, e55629.
- Ndruru, S. T. C. L., Widiarto, S., Pramono, E., Wahyuningrum, D., Bundjali, B.andArcana, I. M. 2022a. The Influences of [EMIm] Ac Ionic Liquid for the Characteristics of Li-Ion Batteries' Solid Biopolymer Blend Electrolyte Based on Cellulose Derivatives of MC/CMC Blend. *Macromolecular Chemistry and Physics*, **223**, 2100362.
- Ndruru, S. T. C. L., Widiarto, S., Pramono, E., Wahyuningrum, D., Bundjali, B.andArcana, I. M. 2022b. Modification of Nias' Cacao Pod Husk Cellulose through Carboxymethylation Stages by Using MAOS Method and Its Application as Li-ion Batteries' Biopolymer Electrolyte Membrane. *ChemistrySelect*, **7**, e202202510.
- Ngai, K. S., Ramesh, S., Ramesh, K.andJuan, J. C. 2016. A review of polymer electrolytes: fundamental, approaches and applications. *Ionics*, **22**, 1259-1279.
- Patla, S. K., Ray, R., Asokan, K.andKarmakar, S. 2018. Investigation of ionic conduction in PEO–PVDF based blend polymer electrolytes. *Journal of Applied Physics*, **123**, 125102.
- Polu, A. R.andRhee, H.-W. 2017. Ionic liquid doped PEO-based solid polymer electrolytes for lithium-ion polymer batteries. *International journal of hydrogen energy*, **42**, 7212-7219.
- Pratiwi, R. Y. 2018. *Sintesis Selulosa Ftalat dari Limbah Tongkol Jagung sebagai Pengisi pada Membran Polimer Elektrolit Selulosa Asetat/Litium Asetat untuk Aplikasi Baterai Ion Litium*. Institut Teknologi Bandung.
- Pujokaroni, A. S., Marseno, D. W.andPranoto, Y. 2022. Sintesis dan karakterisasi sodium karboksimetil selulosa dari serabut kelapa sawit. *Journal of Tropical AgriFood*, **3**, 101-113.
- Rahim, E. A., Turumi, G. S.andBahri, S. 2021. Pemanfaatan Selulosa dari Rumput Gajah (*Pennisetum purpureum*) pada Sintesis Karboksimetil Selulosa (CMC). *KOVALEN: Jurnal Riset Kimia*, **7**, 146-153.

- Rajeh, A., Morsi, M.andElashmawi, I. 2019. Enhancement of spectroscopic, thermal, electrical and morphological properties of polyethylene oxide/carboxymethyl cellulose blends: combined FT-IR/DFT. *Vacuum*, **159**, 430-440.
- Rasali, N.andSamsudin, A. 2018. Ionic transport properties of protonic conducting solid biopolymer electrolytes based on enhanced carboxymethyl cellulose-NH 4 Br with glycerol. *Ionics*, **24**, 1639-1650.
- Rosado, M. J., Rencoret, J., Marques, G., Gutiérrez, A.andDel Río, J. C. 2021. Structural characteristics of the guaiacyl-rich lignins from rice (*Oryza sativa L.*) husks and straw. *Frontiers in Plant Science*, **12**, 640475.
- Saadiah, M., Nagao, Y.andSamsudin, A. 2021. Enhancement on protonation (H β) with incorporation of flexible ethylene carbonate in CMCePVAe30 wt% NH 4 NO 3 film. *international journal of hydrogen energy*, **46**, e17245.
- Saadiah, M.andSamsudin, A. Electrical study on Carboxymethyl Cellulose-Polyvinyl alcohol based bio-polymer blend electrolytes. IOP conference series: materials science and engineering, 2018. IOP publishing, 012045.
- Saadiah, M., Zhang, D., Nagao, Y., Muzakir, S.andSamsudin, A. 2019. Reducing crystallinity on thin film based CMC/PVA hybrid polymer for application as a host in polymer electrolytes. *Journal of Non-Crystalline Solids*, **511**, 201-211.
- Safitri, D., Rahim, E. A., Prismawiryanti, P.andSikanna, R. 2017. Sintesis Karboksimetil Selulosa (CMC) dari Selulosa Kulit Durian (*Durio zibethinus*). *KOVALEN: Jurnal Riset Kimia*, **3**, 58-68.
- Sallal, A. A., Hassan, H. M.andIbrahim, M. Improving optical properties of polyvinyl alcohol (pva) and carboxymethyl cellulose (cmc) as polymer blend films (cmc-pva). Proceedings of the 6th International Conference on Future Networks & Distributed Systems, 2022. 652-656.
- Sari, N. W., Fajri, M. Y.andWilapangga, A. 2018. Analisis fitokimia dan gugus fungsi dari ekstrak etanol pisang goroho merah (MUSA ACUMINATE (L)). *Indonesian Journal of Biotechnology and Biodiversity*, **2**.
- Seni, B. P. K. 2019. OPTIMASI PROSES DELIGNIFIKASI PELEPAH PISANG UNTUK BAHAN. *SEBATIK Volume 23 Nomer 2 Desemeber 2019*, 447.
- Shamsuri, N., Zaine, S., Yusof, Y., Yahya, W.andShukur, M. 2020. Effect of ammonium thiocyanate on ionic conductivity and thermal properties of polyvinyl alcohol-methylcellulose-based polymer electrolytes. *Ionics*, **26**, 6083-6093.
- Silviani, S. 2021. *Sintesis Karboksimetil Selulosa (CMC) dari Batang Pisang Kastrol* (*Musa paradisiaca var. Kastrol*). UIN Sunan Gunung Djati Bandung.
- Singh, R. K.andSingh, A. K. 2013. Optimization of reaction conditions for preparing carboxymethyl cellulose from corn cobic agricultural waste. *Waste and Biomass Valorization*, **4**, 129-137.
- Subiandono, E., Heriyanto, N.andKarlina, E. 2011. *Potensi nipah (Nypa fruticans (Thunb.) Wurm.) sebagai sumber pangan dari hutan mangrove*, Indonesian Ministry of Agriculture.

- Sugiarto, E. 2013. *Pemanfaatan Serat Pelepas Nipah (Nypa fruticans) Sebagai Bahan Baku Alternatif Pembuatan Kertas Seni (Kajian Proporsi Bahan Baku Dan Perekat)*. Universitas Brawijaya.
- Suhaimi, L., Bahtiar, S. and Alfaruqi, M. H. 2020. Studi Teoritis Material Katoda Baterai Ion Litium LiFePO₄ Berdasarkan Kalkulasi Teori Fungsional Kerapatan. *Hexagon Jurnal Teknik dan Sains*, **1**, 52-56.
- Trache, D., Tarchoun, A. F., Derradji, M., Hamidon, T. S., Masruchin, N., Brosse, N. and Hussin, M. H. 2020. Nanocellulose: from fundamentals to advanced applications. *Frontiers in Chemistry*, **8**, 392.
- Utami, K., Wati, J., Veronika, S., Astuti, R. W. and Rahimuddin, R. 2020. Pengaruh Penggunaan Aplikasi Chemdraw Sebagai Sumber Belajar Kimia Terhadap Peningkatan Hasil Belajar Mahasiswa pada Materi Spektroskopi NMR. *KATALIS: Jurnal Penelitian Kimia dan Pendidikan Kimia*, **3**, 24-30.
- Wahyuni, H. S., Yuliasmi, S., Aisyah, H. S. and Riati, D. 2019. Characterization of synthesized sodium carboxymethyl cellulose with variation of solvent mixture and alkali concentration. *Open Access Macedonian Journal of Medical Sciences*, **7**, 3878.
- Wijana, S., Rahmah, N. L. and Ansory, D. 2013. Studi Proses Pulping Serat Pelepas dan Serat Kulit Buah Nipah (Nypa fruticans) dengan Metode Kimia (Kajian Konsentrasi Larutan NaOH). *Industria: Jurnal Teknologi dan Manajemen Agroindustri*, **2**, 37-46.
- Willfahrt, A., Steiner, E., Hötzl, J. and Crispin, X. 2019. Printable acid-modified corn starch as non-toxic, disposable hydrogel-polymer electrolyte in supercapacitors. *Applied Physics A*, **125**, 1-10.
- Wongvitvichot, W., Pithakratananayothin, S., Wongkasemjit, S. and Chaisuwan, T. 2021. Fast and practical synthesis of carboxymethyl cellulose from office paper waste by ultrasonic-assisted technique at ambient temperature. *Polymer Degradation and Stability*, **184**, 109473.
- Xiao, S., Yang, Y., Li, M., Wang, F., Chang, Z., Wu, Y. and Liu, X. 2014. A composite membrane based on a biocompatible cellulose as a host of gel polymer electrolyte for lithium ion batteries. *Journal of power sources*, **270**, 53-58.
- Yao, P., Yu, H., Ding, Z., Liu, Y., Lu, J., Lavorgna, M., Wu, J. and Liu, X. 2019. Review on polymer-based composite electrolytes for lithium batteries. *Frontiers in chemistry*, **7**, 522.
- Yulianti, E., Saputri, R. D., Sudaryanto, S., Jodi, H. and Salam, R. 2013. Pembuatan Bahan Polimer Elektrolit Padat Berbasis Nanokomposit Kitosan Montmorillonite untuk Aplikasi Baterai. *Jurnal Kimia dan Kemasan*, **35**, 77-83.
- Yuliasmi, S., Ginting, N., Wahyuni, H. S., Sigalingging, R. T. and Sibarani, T. 2019. The Effect of Alkalization on Carboxymethyl Cellulose Synthesis from Stem and Peel Cellulose of Banana. *Open Access Macedonian Journal of Medical Sciences*, **7**, 3874.

- Yuliatun, S., Attaya, Z.andFebrianto, K. 2024. Optimasi Proses Bleaching Selulosa Ampas Tebu dengan Menggunakan Metode Respon Permukaan. *Indonesian Sugar Research Journal*, **4**, 43-55.
- Yunita, V. A. 2020. *Sintesis Karboksimetil Selulosa (CMC) dari Selulosa Pelepas Nipah (Nypa fruticans) Sebagai Flukolan*. Universitas Islam Negeri Makassar.
- Yusof, Y.andKadir, M. 2016. Electrochemical characterizations and the effect of glycerol in biopolymer electrolytes based on methylcellulose-potato starch blend. *Molecular Crystals and Liquid Crystals*, **627**, 220-233.
- Zahara, A. W. L., Haryanti, N. H.andManik, T. N. 2024. Studi Alkalisasi Serat Bemban Termodifikasi KOH.
- Zainuddin, N., Rasali, N., Mazuki, N., Saadiah, M.andSamsudin, A. 2020. Investigation on favourable ionic conduction based on CMC-K carrageenan proton conducting hybrid solid bio-polymer electrolytes for applications in EDLC. *International Journal of Hydrogen Energy*, **45**, 8727-8741.
- Zeng, F., Sun, Y., Hui, B., Xia, Y., Zou, Y., Zhang, X.andYang, D. 2020. Three-dimensional porous alginate fiber membrane reinforced PEO-based solid polymer electrolyte for safe and high-performance lithium ion batteries. *ACS Applied Materials & Interfaces*, **12**, 43805-43812.
- Zhou, L., Liu, S., Li, W., Song, H., Du, L.andCui, Z. 2023. Highly conductive Poly (ϵ -caprolactone) and chitosan based polymer electrolyte for lithium metal battery. *Journal of Power Sources*, **553**, 232271.
- Zikrillah, M., Muharja, M., Darmayanti, R. F., Batuthoh, M. W. I.andKhamil, A. I. 2023. Metode baru perhitungan viskositas intrinsik dan berat molekul polihidroksialcanoat untuk produksi plastik biodegradable. *Jurnal Penelitian IPTEKS*, **8**, 188-195.
- Zulkifli, A., Saadiah, M., Mazuki, N.andSamsudin, A. 2020. Characterization of an amorphous materials hybrid polymer electrolyte based on a LiNO₃-doped, CMC-PVA blend for application in an electrical double layer capacitor. *Materials Chemistry and Physics*, **253**, 123312.