

## DAFTAR PUSTAKA

- 1 Suhariyanto, D. *Statistik Teh Indonesia 2019*; Perkebunan, S. S. T., Ed.; Badan Pusat Statistik, **2019**.
- 2 Béguin, F.; Presser, V.; Balducci, A.; Frackowiak, E. Carbons and Electrolytes for Advanced Supercapacitors. *Adv. Mater.* **2014**, *26* (14), 2219–2251.
- 3 P. Siagian, S. Manajemen Sumber Daya Manusia. *Jakarta cetakan kedelapan belas BUMI RAKSA* **2010**, *21*, 50–55.
- 4 Bajpai, S. K.; Jain, A. Removal of Copper(II) from Aqueous Solution Using Spent Tea Leaves (STL) as a Potential Sorbent. *Water SA* **2010**, *36* (3), 221–228.
- 5 Yuningsih, L. M.; Mulyadi, D.; Kurnia, A. J. Pengaruh Aktivasi Arang Aktif Dari Tongkol Jagung Dan Tempurung Kelapa Terhadap Luas Permukaan Dan Daya Jerap Iodin. *J. Kim. Val.* **2016**, *2* (1), 30–34.
- 6 Kwiatkowski, M.; Broniek, E. An Analysis of the Porous Structure of Activated Carbons Obtained from Hazelnut Shells by Various Physical and Chemical Methods of Activation. *Colloids Surfaces A Physicochem. Eng. Asp.* **2017**, *529* (June), 443–453.
- 7 Chen, T.; Dai, L. Carbon Nanomaterials for High-Performance Supercapacitors. *Mater. Today* **2013**, *16* (7–8), 272–280.
- 8 Pagketanang, T.; Artnaseaw, A.; Wongwicha, P.; Thabuot, M. *Microporous Activated Carbon from KOH-Activation of Rubber Seed-Shells for Application in Capacitor Electrode*; Elsevier B.V., **2015**; Vol. 79.
- 9 Teng, Y.; Liu, E.; Ding, R.; Liu, K.; Liu, R.; Wang, L.; Yang, Z.; Jiang, H. Bean Dregs-Based Activated Carbon/Copper Ion Supercapacitors. *Electrochim. Acta* **2016**, *194*, 394–404.
- 10 Yin, L.; Chen, Y.; Li, D.; Zhao, X.; Hou, B.; Cao, B. 3-Dimensional Hierarchical Porous Activated Carbon Derived from Coconut Fibers with High-Rate Performance for Symmetric Supercapacitors. *Mater. Des.* **2016**, *111*, 44–50.
- 11 Yu, B.; Chang, Z.; Wang, C. The Key Pre-Pyrolysis in Lignin-Based Activated Carbon Preparation for High Performance Supercapacitors. *Mater. Chem. Phys.* **2016**, *181*, 187–193.
- 12 Aziz, H.; Tetra, O. N.; Alif, A.; Syukri; Ramadhan, W. Electrical Properties of Supercapacitor Electrode-Based on Activated Carbon from Waste Palm Kernel Shells. *Der Pharma Chem.* **2016**, *8* (15), 227–232.
- 13 Esterlita, M. O.; Herlina, N. Pembuatan Karbon Aktif Dari Pelelah Aren ( Arenga Pinnata ). *J. Tek. Kim. USU* **2015**, *4* (1), 47–52.
- 14 Barnawi, I. I.; Taer, E.; Umar, A. A. Efek Penumbuhan Nanopartikel Platinum Pada Elektroda Karbon Terhadap Prestasi Superkapasitor. *J. Fis. Himpun. Fis. Indones.* **2013**, *11* (1), 1–5.
- 15 Li, Y.; Van Zijll, M.; Chiang, S.; Pan, N. KOH Modified Graphene Nanosheets for Supercapacitor Electrodes. *J. Power Sources* **2011**, *196* (14), 6003–6006.
- 16 Sun, G.; Liu, J.; Zhang, X.; Wang, X.; Li, H.; Yu, Y.; Huang, W.; Zhang, H.; Chen, P. Fabrication of Ultralong Hybrid Microfibers from Nanosheets of Reduced Graphene Oxide and Transition-Metal Dichalcogenides and Their Application as Supercapacitors. *Angew. Chemie - Int. Ed.* **2014**, *53* (46), 12576–12580.
- 17 Lin, G.; Ma, R.; Zhou, Y.; Liu, Q.; Dong, X.; Wang, J. KOH Activation of Biomass-Derived Nitrogen-Doped Carbons for Supercapacitor and Electrocatalytic Oxygen Reduction. *Electrochim. Acta* **2018**, *261*, 49–57.
- 18 Zhang, J. M.; Hua, Q.; Li, J.; Yuan, J.; Peijs, T.; Dai, Z.; Zhang, Y.; Zheng, Z.; Zheng, L.; Tang, J. Cellulose-Derived Highly Porous Three-Dimensional Activated Carbons for Supercapacitors. *ACS Omega* **2018**, *3* (11), 14933–14941.

- 19 Liu, X.; Ma, C.; Li, J.; Zielinska, B.; Kalenczuk, R. J.; Chen, X.; Chu, P. K.; Tang, T.; Mijowska, E. Biomass-Derived Robust Three-Dimensional Porous Carbon for High Volumetric Performance Supercapacitors. *J. Power Sources* **2019**, *412* (June 2018), 1–9.
- 20 Frackowiak, E. Supercapacitors Based on Carbon Materials and Ionic Liquids. *J. Braz. Chem. Soc.* **2006**, *17* (6), 1074–1082.
- 21 Le Van, K.; Luong Thi, T. T. Activated Carbon Derived from Rice Husk by NaOH Activation and Its Application in Supercapacitor. *Prog. Nat. Sci. Mater. Int.* **2014**, *24* (3), 191–198.
- 22 Godse, L. S.; Karandikar, P. B.; Khaladkar, M. Y. Study of Carbon Materials and Effect of Its Ball Milling, on Capacitance of Supercapacitor. *Energy Procedia* **2014**, *54* (December), 302–309.
- 23 Sharma, P.; Bhatti, T. S. A Review on Electrochemical Double-Layer Capacitors. *Energy Convers. Manag.* **2010**, *51* (12), 2901–2912.
- 24 Tetra, O. N.; Aziz, H.; Ibrahim, S.; Alif, A.; Kimia, J.; Matematika, F.; Ilmu, D.; Alam, P.; Andalas, U.; Limau, K.; Padang, M. Review: Superkapasitor Berbahan Dasar Karbon Aktif Dan Larutan Ionik Sebagai Elektrolit Review: Superkapasitor Based on Activated Carbon and Ionic Solution As Electrolyte. *J. Zarah* **2018**, *6* (1), 39–46.
- 25 Yalc, N.; Sevinc, V. Studies of the Surface Area and Porosity of Activated Carbons Prepared from Rice Husks. **2000**, *38*, 1943–1945.
- 26 Koleangan, H. S. J. Kajian Stabilitas Termal Dan Karakter Kovalen Zat Pengaktif Pada Arang Aktif Limbah Gergajian Kayu Meranti (*Shorea Spp*). *J. Ilm. Sains* **2011**, *11*, 2–6.
- 27 Pambayun, G. S.; Yulianto, R. Y. E.; Rachimoellah, M.; Putri, E. M. M. Pembuatan Karbon Aktif Dari Arang Tempurung Kelapa Dengan Aktivator ZnCl<sub>2</sub> Dan Na<sub>2</sub>CO<sub>3</sub> Sebagai Adsorben Untuk Mengurangi Kadar Fenol Dalam Air Limbah. *J. Tek. Pomits* **2013**, *2* (1), 116–120.
- 28 Liu, Z.; Zhu, Z.; Dai, J.; Yan, Y. Waste Biomass Based-Activated Carbons Derived from Soybean Pods as Electrode Materials for High-Performance Supercapacitors. *ChemistrySelect* **2018**, *3* (21), 5726–5732.
- 29 Banjow, I. Elemental Analysis of Coconut Shell Activated Carbon Using Ultimate Analysis Dosen Pengajar : Dr . Eng . Abdul Waris “ Analisis Unsur Karbon Aktif Tempurung Kelapa Dengan Metode Analisis Ultimat ( Ultimate Analysis ).” **2014**, No. August 2012.
- 30 Norita Tetra, O.; Aziz, H.; Arifn, B.; Novia, A. Pengaruh Penambahan Karbon Aktif Dari Tanah Gambut Terhadap Kapasitansi Elektroda Superkapasitor Berbahan Dasar Karbon Aktif Cangkang Kelapa Sawit the Effect of Addition of Activated Carbons From Peat on Performance of Superkapasitor Base of Activated Car. *J. Zarah* **2018**, *6* (2), 47–52.
- 31 Yang, P.; Xiao, X.; Li, Y.; Ding, Y.; Qiang, P.; Tan, X.; Mai, W.; Lin, Z. Hydrogenated ZnO Core À Shell Nanocables for Flexible Supercapacitors. *ACS Nano* **2013**, No. 3, 2617–2626.
- 32 Mardiah, M.; Lapua, E. P.; Wahyudiantara, I. P.; Iqbal, M.; Lestari, I.; Rodiyatunnisa, R.; Sakinah, N.; Novianti, H. L.; Fadilah, O. A. Studi Laju Korosi Logam Aluminium Dengan Penambahan Inhibitor Dari Ekstrak Daun Karamunting (*Rhodomyrtus Tomentosa*) Dalam Larutan NaCl. *J. Chemurg.* **2018**, *1* (2), 39.
- 33 Tutuş, A.; Kazaskeroğlu, Y.; çiçekler, M. Evaluation of Tea Wastes in Usage Pulp and Paper Production. *BioResources* **2015**, *10* (3), 5395–5406.
- 34 Tetra, O. N.; Aziz, H.; Emriadi; Wahyuni, H.; Alif, A. Performance of TIO<sub>2</sub>-Carbon on Ceramic Template with Sodium Hydroxide Activation as

- Supercapacitor Electrode Materials. *Der Pharma Chem.* **2016**, 8 (17), 26–30.
- 35 Prahastika, D.; Kartika, Y.; Indraswati, N.; Ismadji, S. Activated Carbon from Jackfruit Peel Waste by H<sub>3</sub>PO<sub>4</sub> Chemical Activation: Pore Structure and Surface Chemistry Characterization. *Chem. Eng. J.* **2008**, 140 (1–3), 32–42.
- 36 Perwira, G. *Analisis Luas Permukaan Arang Dengan Menggunakan Metoda BET*; Jurusan Kimia FMIPA Universitas Negeri Semarang: Semarang, 2010.
- 37 Hwang, N.; Barron, A. R. *BET Surface Area Analysis of Nanoparticles*; 2001; Vol. 39.
- 38 Donohue, M. D.; Aranovich, G. L. Classification of Gibbs Adsorption Isotherms. *Adv. Colloid Interface Sci.* **1998**, 76–77, 137–152.
- 39 Hashim, D. M.; Man, Y. B. C.; Norakasha, R.; Shuhaimi, M.; Salmah, Y.; Syahariza, Z. A. Potential Use of Fourier Transform Infrared Spectroscopy for Differentiation of Bovine and Porcine Gelatins. *Food Chem.* **2010**, 118 (3), 856–860.
- 40 Hanke, L. Handbook of Analytical Methods for Materials. *Mater. Eval. Eng. Inc* **2001**, 1–50.
- 41 Miller, J. R.; Simon, P. Electrochemical Capacitors for Energy Management. **2012**, 651 (2008).
- 42 Topayung, D. Pengaruh Arus Listrik Dan Waktu Proses Terhadap Ketebalan Dan Massa Lapisan Yang Terbentuk Pada Proses Elektroplating Pelat Baja. *J. Ilm. Sains* **2011**, 11 (Dc).
- 43 Ravichandran, P.; Sugumaran, P.; Seshadri, S.; Basta, A. H. Optimizing the Route for Production of Activated Carbon from Casuarina Equisetifolia Fruit Waste. *R. Soc. Open Sci.* **2018**, 5 (7).
- 44 Anas, M.; Jahiding, M.; Ratna; Hasanah, A.; Kurniadi, D. Analisis Ultimate Dan Sifat Struktur Arang Aktif Dari Kulit Biji Mete: Pengaruh Temperatur Aktivasi. **2014**, No. April, 21–23.
- 45 Kurniati, E. Pemanfaatan Cangkang Kelapa Sawit Sebagai Arang Aktif. **2008**, 8 (2), 96–103.
- 46 Yacob, A. R.; Abdul Majid, Z.; Sari, D. D. R.; A/p, I. V. Comparison of Various Sources of High Surface Area Carbon Prepared by Different Types of Activation. *Malaysian J. Anal. Sci.* **2008**, 12 (1), 264–271.
- 47 Marsh., F. R.-R. H. *Characterization of Activated Carbon*; 2006; Vol. 143–242.
- 48 Mulyati, T. A.; Pujiono, F. E.; Ilmu, I.; Bhakti, K.; Kh, J.; Hasyim, W. Aktivator Koh. **2017**, No. 2, 1–7.
- 49 La Agus, Y. Fabrikasi Komposit Graphene/TiO<sub>2</sub>/Pani Sebagai Bahan Elektroda Baterai Lithium-Ion (LI-ION). *J. Apl. Fis.* **2016**, 13 (1), 14–23.
- 50 Thommes, M.; Kaneko, K.; Neimark, A. V.; Olivier, J. P.; Rodriguez-Reinoso, F.; Rouquerol, J.; Sing, K. S. W. Physisorption of Gases, with Special Reference to the Evaluation of Surface Area and Pore Size Distribution (IUPAC Technical Report). *Pure Appl. Chem.* **2015**, 87 (9–10), 1051–1069.
- 51 Vasilevich, R.; Lodygin, E.; Beznosikov, V.; Abakumov, E. Molecular Composition of Raw Peat and Humic Substances from Permafrost Peat Soils of European Northeast Russia as Climate Change Markers. *Sci. Total Environ.* **2018**, 615, 1229–1238.
- 52 Wang, C. H.; Wen, W. C.; Hsu, H. C.; Yao, B. Y. High-Capacitance KOH-Activated Nitrogen-Containing Porous Carbon Material from Waste Coffee Grounds in Supercapacitor. *Adv. Powder Technol.* **2016**, 27 (4), 1387–1395.
- 53 Yanti, S.; Taer, E.; Matematika, F.; Alam, P.; Riau, U.; Bina, K. Efek Modifikasi Permukaan Karbon Aktif Monolit Terhadap Sifat Fisis Dan Elektrokimia Sel Superkapasitor. **2014**, 1 (2), 161–168.
- 54 Taer, E.; Andriani, R. Pengaruh Ketebalan Elektroda Terhadap Nilai

- Kapasitansi Spesifik Dan " Retained Ratio" Serbuk Gergaji Kayu Karet Untuk Pembuatan Superkapasitor. *Pros. Semin. Nas. Fisilka II* **2010**, 72–78.
- 55 Piluharto, B.; Sjaifullah, A.; Rahmawati, I.; Nurhianto, E. Membran Blend Kitosan/Poli Vinil Alkohol (PVA): Pengaruh Komposisi Material Blend, PH, Dan Konsentrasi Bahan Pengikat Silang. *J. Kim. Ris.* **2017**, 2 (2), 77.
- 56 Sutrisno, B. A. Studi PengukuranKapasitansi Dan Konstanta Dielektrik Pada Cabe Merah ( *Capsicum Annum L.* ) Giling. *Phys. Student J.* **2014**, 2 (1), 2–4.
- 57 Manik, S. T.; Taer, E.; Iwantono. Impedansi Spektroskopi Sel Superkapasitor Menggunakan Elektroda Karbon Bentuk Monolit Dari Ampas Tebu. 1–7.
- 58 Kemp, K. C.; Baek, S. Bin; Lee, W. G.; Meyyappan, M.; Kim, K. S. Activated Carbon Derived from Waste Coffee Grounds for Stable Methane Storage. *Nanotechnology* **2015**, 26 (38).

