

Referensi

- [1] A. C. Lazanas and M. I. Prodromidis, “Electrochemical Impedance Spectroscopy - A Tutorial,” 2023, doi: 10.1021/acsmeasuresciau.2c00070.
- [2] A. L. Rahman, I. W. Fathonah, and R. A. Salam, “Rancang Bangun Potensiostat Dengan Frekuensi Kerja 1Hz - 40kHz untuk Keperluan Electrochemical Impedance Spectroscopy,” vol. 8, no. 5, pp. 1–7, 2021.
- [3] M. Hendrawan, I. W. Fathona, and C. Saputra, “Rancang Bangun Electrochemical Impedance Spectroscopy dengan Sumber Sinyal Segitiga,” pp. 1–7, 2023.
- [4] E. P. Randviir and C. E. Banks, “Electrochemical impedance spectroscopy: An overview of bioanalytical applications,” *Analytical Methods*, vol. 5, no. 5, pp. 1098–1115, 2013, doi: 10.1039/c3ay26476a.
- [5] A. J. Bard and L. R. Faulkner, *Double-Layer Structure and Adsorption*. 2001.
- [6] J. R. Macdonald and a J. Wiley, *Theory , Experiment , and*.
- [7] L. Wang *et al.*, “Electrochemical Impedance Spectroscopy (EIS) study of LiNi 1/3Co 1/3Mn 1/3O 2 for Li-ion batteries,” *Int J Electrochem Sci*, vol. 7, no. 1, pp. 345–353, 2012, doi: 10.1016/s1452-3981(23)13343-8.
- [8] J. Shakya, “Design and Fabrication of High,” vol. 3, no. 1, pp. 373–376, 1998.
- [9] T. Arévalo-ramírez, C. C. Torres, C. Rosero, and P. Espinoza-montero, “for Its Design and Construction,” 2016.
- [10] D. King, J. Friend, and J. Kariuki, “Measuring vitamin c content of commercial orange juice using a pencil lead electrode,” *J Chem Educ*, vol. 87, no. 5, pp. 507–509, 2010, doi: 10.1021/ed800151x.
- [11] C. Fan, K. W. Plaxco, and A. J. Heeger, “Electrochemical interrogation of conformational changes as a reagentless method for the sequence-specific detection of DNA,” *Proc Natl Acad Sci U S A*, vol. 100, no. 16, pp. 9134–9137, 2003, doi: 10.1073/pnas.1633515100.
- [12] J. E. Harrar, “The potentiostat and the voltage clamp,” *Electrochemical Society Interface*, vol. 22, no. 4, pp. 42–44, 2013, doi: 10.1149/2.F01134if.

- [13] P. Busono, R. Febryarto, and M. Mayantasasi, "Rancang Bangun Potentiostat Ekonomis Berbasis Mikrokontroler untuk Aplikasi Sensor Elektrokimia," *Prosiding Semnastek*, pp. 1–7, 2018.
- [14] S. M. M. Alavi, A. Mahdi, S. J. Payne, and D. A. Howey, "Identifiability of Generalized Randles Circuit Models," *IEEE Transactions on Control Systems Technology*, vol. 25, no. 6, pp. 2112–2120, 2017, doi: 10.1109/TCST.2016.2635582.
- [15] R. N. Vyas, K. Li, and B. Wang, "Modifying randles circuit for analysis of polyoxometalate layer-by-layer films," *Journal of Physical Chemistry B*, vol. 114, no. 48, pp. 15818–15824, 2010, doi: 10.1021/jp105075t.
- [16] F. Sepúlveda, J. Hernández, and A. Manríquez, "Construction of a Potentiostat to Perform Electrochemical Impedance Spectroscopy (EIS) Tests," *Modern Instrumentation*, vol. 06, no. 02, pp. 15–27, 2017, doi: 10.4236/mi.2017.62002.
- [17] M. Mahdavian and M. M. Attar, "Another approach in analysis of paint coatings with EIS measurement: Phase angle at high frequencies," *Corros Sci*, vol. 48, no. 12, pp. 4152–4157, 2006, doi: 10.1016/j.corsci.2006.03.012.
- [18] Q. Cheng and Z. Chen, "The Cause Analysis of the Incomplete Semi-Circle Observed in High Frequency Region of EIS Obtained from TEL-Covered Pure Copper," *Int J Electrochem Sci*, vol. 8, no. 6, pp. 8282–8290, Jun. 2013, doi: 10.1016/S1452-3981(23)12887-2.
- [19] E. O. Brigham and R. E. Morrow, "The fast Fourier transform," *IEEE Spectr*, vol. 4, no. 12, pp. 63–70, 1967, doi: 10.1109/MSPEC.1967.5217220.
- [20] G. S. Popkirov and R. N. Schindler, "A new impedance spectrometer for the investigation of electrochemical systems," *Review of Scientific Instruments*, vol. 63, no. 11, pp. 5366–5372, 1992, doi: 10.1063/1.1143404.
- [21] D. T. Kusuma, "Fast Fourier Transform (FFT) Dalam Transformasi Sinyal Frekuensi Suara Sebagai Upaya Perolehan Average Energy (AE) Musik," *Petir*, vol. 14, no. 1, pp. 28–35, 2020, doi: 10.33322/petir.v14i1.1022.
- [22] M. Jakubowska, "Signal Processing in Electrochemistry," *Electroanalysis*, vol. 23, no. 3, pp. 553–572, 2011, doi: 10.1002/elan.201000465.
- [23] H. Mandaliya, P. Mankodi, and B. Makwana, "Microcontroller Based DDS Function Generator," vol. 2, no. 1, pp. 483–486, 2013.

- [24] B. Chen and Z. Liang, "The design and implementation of high frequency signal generator based on DDS," *Proceedings - 8th International Conference on Instrumentation and Measurement, Computer, Communication and Control, IMCCC 2018*, pp. 1151–1155, 2018, doi: 10.1109/IMCCC.2018.00239.
- [25] J. Vankka, *Direct Digital Synthesizers: Theory, Design and Applications*, no. November. 2000.
- [26] J. Vankka, M. Waltari, M. Kosunen, and K. A. I. Halonen, "A direct digital synthesizer with an on-chip D/A-converter," *IEEE J Solid-State Circuits*, vol. 33, no. 2, pp. 218–227, 1998, doi: 10.1109/4.658623.
- [27] Analog Devices, "Low Power, 12.65 mW, 2.3 V to 5.5 V, Programmable Waveform Generator AD9833," pp. 1–21, 2019, [Online]. Available: www.analog.com
- [28] A. Devices, "Low Cost, High Speed, Rail-to-Rail Amplifiers", [Online]. Available: www.analog.com
- [29] "Mcp41xxx/42xxx Single / Dual Digital Potentiometer with SPI TM Interface." Microchip Technology Inc., pp. 1–32, 2003.
- [30] J. Rowe, "The new standard components ! Using Cheap Asian Electronic Modules Part 1," *Everyday Practical Electronics*, pp. 34–39, 2018.
- [31] A. Devices, "Dual Bipolar/JFET , Audio Operational Amplifier," pp. 1–12, 2004, [Online]. Available: <http://www.analog.com/media/en/technical-documentation/data-sheets/OP275.pdf>