JBREV
Journal of Batteries for Renewable Energy and Electric Vehicle

e-ISSN 2987-6931
p-ISSN 2987-6907
Vol. 01 No. 02
November 2023

Exist for publishing the results of research and development in battery technology for renewable energy and electric vehicles

Publisher: NBRI Press (*Penerbit Yayasan Pusat Unggulan Inovasi Baterai dan Energi Terbarukan*)

Mailing Address: National Battery Research Institute, Indonesian Life Science Center, Technology Business Zone BRIN Puspiptek Area, Bogor, 16340, West Java, Indonesia
Phone (+62) 81181251717, E-mail: nbri.jbrev@n-bri.org
Web: https://journal.n-bri.org/

e-ISSN 2987-6931
p-ISSN 2987-6907

JBREV
Vol. 01 No. 02
November 2023

Contents

EDITORIAL

Dear our valuable reader,

It is a great pleasure to provide you with the second issue of Journal of Batteries for Renewable Energy and Electric Vehicles (JBREV), namely Vol. 01 No. 02 (2023). The JBREV is established in 2022 by the National Battery Research Institute (NBRI) in collaboration with the Queen Mary University of London (QMUL), Material Research Society Indonesia (MRS-INA), and International Union of Material Research Societies (IUMRS). The JBREV is devoted to publish new and original research, article review related to battery materials, science & engineering that applicable to renewable energy and electric vehicles. The JBREV is for researchers and technology enthusiasts in all aspects of the science, technology, and applications of battery energy storage for renewable energy and electric vehicles.

The JBREV Vol. 01 No. 02 (2023) contains five articles discussing graphene as promising material for battery technology, mechanical vibration test equipment design, cathode battery material processing, battery recycling, to spatial mapping for solar farm prospective. There are 26 authors and co-authors in total, of those 5 articles, who come from various institutions (National Research and Innovation Agency, National Battery Research Institute, University of Gadjah Mada, Universitas Dian Nusantara and University of Indonesia)

"A Review on Graphene: Synthesis Methods, Sources, and Applications" was explored by E. Kartini from National Battery Research Institute collaborating with T. A. Setiadi from Department of Chemistry, University of Gadjah Mada, Yogyakarta, Indonesia and M. Fakhrudin from Research Center for Advanced Materials, National Research and Innovation Agency. This review includes three major categories which discuss several ways to synthesize graphene, its sources, and its application, particularly in the field of battery. Since there are many ways to produce graphene, this paper evaluates which methods would be best for different applications of graphene to overcome the high production cost of graphene, environmental damages, and low purity of graphene.

"Mechanical Vibration Test Equipment Design Laboratory Capacity for Automotive Industry" was written by R. Firmansyah in collaboration with M. Sugeng from Department of Mechanical Engineering, Universitas Dian Nusantara, Jakarta, Indonesia. This research presents the effective design for mechanical vibration test in laboratory capacity. Since vibration monitoring can also be used to find vibration levels caused by misaligned shafts and unbalanced masses, so that this simulation can obtain the ideal condition of table frame to support the performance of the machine during used.

"Spatial Mapping and Potential Analysis of Solar Farm Prospective through GIS Utilization as Energy Sovereignty Technical Consideration for the New National Capital City (IKN) Area Development" was explored by S. E. Andoko, A. H. Wibowo, and A. H. Nabila from Department of Geosciences, Faculty of Mathematics and Natural Sciences, University of Indonesia, Indonesia. This paper presents an insight of solar farm prospective project in IKN City through GIS utilization for spatial mapping. Through 4D (define, design, deliver, and discover) method, the results indicates that the IKN development area has significant potential for solar energy generation due to their favorable solar irradiance levels, land availability, and proximity to existing infrastructure.

"The Effect of Calcination Temperature on $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ Cathode Material for Lithium-Ion Batteries" was studied by S. Rahayu in collaboration with M. D. Gumelar, S. Husin, D. A. Saputra, H. Yuliani, G. Taqwatomo, O. P. Arjasa, A. Agustanhakri, and A. H. Budiman from Center for Conversion and Conservation Energy, National Research and Innovation Agency, Indonesia. Meanwhile A. U. Saudi, R. Tasomara, W. T. Utami, A. U. Hapsari, J. Raharjo, and Y. A. Andrameda from Center for Advanced Materials, National Research and Innovation Agency, Indonesia as co-author. This research presents the effect of calcination temperature for the performance of NMC-111 cathode battery material. This research used physical characteristics such as X-Ray Diffraction (XRD), Scanning Electron Microscopy-Energy Dispersive Spectroscopy (SEM-EDS0, and Particle Size Analysis (PSA). Through PSA analysis, it is showed that calcination temperature at 800 – 850^{o}C gives the particle less than 400 nm suggesting a potential material for a cathode of lithium-ion batteries.

"Advanced Recycling and Recovery of Spent Lithium-Ion Batteries with Bioleaching Processes using A. ferroxidans to Achieve Cleaner Battery Production" was explored by A. D. Alhaqie and D. M. Damay from Department of Chemical Engineering, Faculty of Engineering, Universitas Gadjah Mada, Indonesia. Meanwhile M. T. Haidar from Department of Engineering Physics, Faculty of Engineering, Universitas Gadjah Mada, Indonesia as co-author. This paper analyzes the potency of bioleaching process utilization to recycle and recover spent lithium-ion batteries through A. *ferroxidans*. By using such methods, it possibly produces weak organic acid waste, more environmentally friendly than the battery cathode synthesis process from metal precursors.

Hopefully, this first edition of JBREV will give a prominent insight on battery technology development and its application that provide beneficial knowledge for all related stakeholders. On behalf of JBREV, I would like to thanks for all of your contribution and endless support that have enabled JBREV to publish its second issue. This could not have been reached without great efforts and cooperation from the editors, reviewers, management personnel, authors, and readers.

Chief Editor