Optimizing performance of Zno as a composite anode by addition of activated carbon for lithium ion batteries = Mengoptimalkan kinerja ZnO sebagai anoda komposit dengan penambahan karbon aktif untuk baterai lithium ion

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Abstrak

Optimalisasi kinerja untuk anoda baterai lithium-ion (LIBs) dapat dilakukan dengan mencampur ZnO-nanorods dengan ketentuan Karbon Aktif. Dalam penelitian ini, ZnO-nanorods di sintesis melalui suatu proses yang menggunakan bahan dasar HMTA dan Zinc Oxide. Untuk mengatasi masalah ini karbon telah diaktifkan karena memiliki sifat konduktivitas yang baik dan dapat mempengaruhi volume yang terjadi. Variasi dalam persentase nanorods ZnO yang 4wt%, 7wt%, dan 10wt%. Karakterisasi sampel diperiksa menggunakan X-Ray Diffraction (XRD), Scanning Electron Microscope (SEM), dan Brunauer-Emmett-Teller (BET). Kinerja baterai sampel diperoleh dengan Electrochemical Impedance Spectroscopy (EIS), Cyclic Voltammetry (CV), dan Charge-Discharge (CD) pengujian setelah dirangkai menjadi baterai sel berbentuk koin.
Penelitian ini membahas tentang pengaruh penambahan karbon aktif terhadap komposit nanorod ZnO. Hasil penelitian menunjukkan bahwa nanorod AC-10%/ZnO-7% memiliki kapasitas spesifik tertinggi 270,9 mAh/g. Menurut tes Brunner-Emmet-Teller (BET), luas permukaan terbesar adalah 631.685 m2/g. Kinerja elektrokimia paling baik diperoleh oleh nanorods AC-10%/ZnO-7%.
<hr>Performance optimization for lithium-ion battery anodes (LIBs) can be done by mixing ZnO-nanorods with the provisions of Active Carbon. In this study, ZnO-nanorods synthesized a process that uses basic ingredients HMTA and Zinc Oxide, in addition. To solve this problem, carbon has been activated because it has good conductivity properties and can affect the volume that occurs. Variations in the percentage of ZnO nanorods which are 4wt%, 7wt%, and 10wt%. Characterization of the samples was examined using X-Ray Diffraction (XRD), Scanning Electron Microscope (SEM), and Brunauer-Emmett-Teller (BET). The battery performance of the samples was obtained by Electrochemical Impedance Spectroscopy (EIS), Cyclic Voltammetry (CV), and Charge-Discharge (CD) testing after being assembled into coin cell batteries.
This study discusses the effect of adding activated carbon to ZnO nanorods composites. The results showed that the AC-10%/ZnO-7% nanorods have the highest specific capacity of 270.9 mAh/g. According to Brunner-Emmet-Teller (BET) test, the largest surface area was 631.685 m2/g. Electrochemical performance is best obtained by AC-10% / ZnO-7% nanorods.