

Porous alloy compound, method for producing the same and electric double layer capacitor

Electric double layer capacitor having both high energy density and high power density

Overview

Since electric double layer capacitors have the advantages of high power density, fast charge/discharge, and long life, from various points of view, research and development have been carried out. On the other hand, compared with lead-acid batteries, the energy density is small, resulting in low specific capacitance and narrow operating potential window. Therefore, for high-energy and high-power applications, new materials with high specific capacitance and high withstand voltage are required, which can be charged and discharged at high speed with high specific capacitance and surpass batteries. However, conventional MnO_2 modification methods mostly consist of metal cation/ MnO_2 systems, and the improvement of electron conduction and capacitance has not been clarified.

The present invention has made it possible to provide a porous alloy compound with a high potential window, a method for producing the porous alloy compound, and an electric double layer capacitor using the porous alloy compound. The present invention is characterized in that the following formula is satisfied.



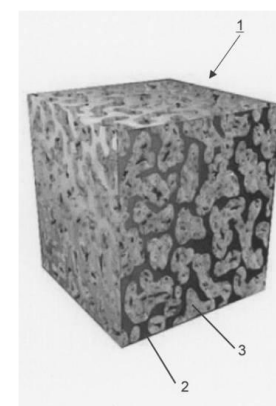
where $a/b/c/d/e/f/g/h$ is 0 or a positive number, $a+b+c+d+e+f+g+h=100$, $d+e>a$, $d+e>b+c$, $20<a+b+c+d+e<40$, $20<f<40$, $20<g<40$.

Product Application

- Electric double layer capacitor
- Next-generation energy storage

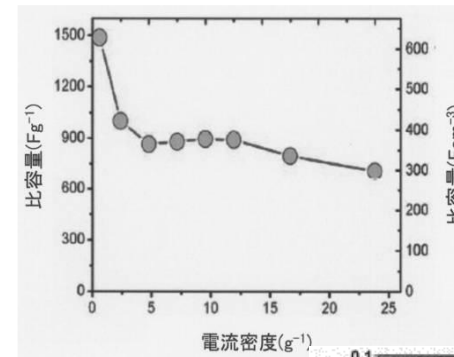
IP Data

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1. Porous alloy compound
2. Metal framework
3. Oxidation-Hydroxide

Specific capacitance characteristics and cycle characteristics of electric double layer capacitor

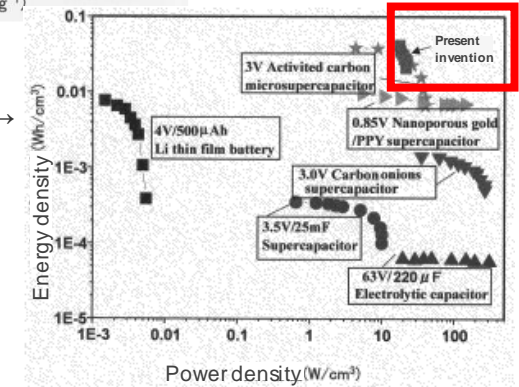


← Specific capacitance characteristics of electric double layer capacitor

- Maximum specific capacity $627Fcm^{-3}$ ($0.25Acm^{-3}$)

Ragone plot of electric double layer capacitor →

High energy density : $51mWh/cm^3$
 High power density : $18W/cm^3$



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