

Abstract

Since 1991, Carbon nanotubes (CNTs) have been caused a worldwide wave of research interests because of its excellent characteristics about optical, electrical and magnetic. But to the present, it's rarely being applied to life owing to its hard-handling tiny-size and the nature of difference between each tube. In this study, in order to overcome the limit above, with the idea of bottom up, we filtrate the suspension of CNTs and make it as a sheet-like bulk material, so called buckypaper (BP). This allows the applications of CNTs in macro-scale achieve.

According to test, BP possesses the features of lightweight, sheet-like, robust, high specific surface area and 78 % porosity. And, after low temperature resistance test, BP shows the negative temperature effect phenomenon. It was assumed that BP is a semimetal material with great conductivity ability. Thus, it was considered to be an excellent dielectric material.

For comparison, BP was light-coated with several kinds of metal oxide, so called modification, to let it possess different electric field characteristics. According to LCR meter test, before modification, BP owns the value 16 of relative permittivity. But, after the modification by light-coating chromium, it will become 2.5 times. That will be controllable depend on what metal was coating. According to Electrochemical workstation test, before modification, BP owns the value 150 F/g of specific capacitances. But, after the modification by light-coating chromium, it will become 1.21 times and have very long cycle life.

It would be possible of BP to make a same revolution in material history as semiconductor did (to replace ferroalloy), because of its precedence electrical properties.

Keyword: *Carbon Nanotube, Buckypaper, Dielectric, Relative permittivity*