GRAPHENE-BASED SUPERCAPACITOR

TECHNOLOGY DESCRIPTION

The technology is a graphene-based supercapacitor which exhibits high energy and power densities that are desired qualities in the electronics industry.

TECHNOLOGY FEATURES

The technology is a energy storage device with high energy and high power density with long life cycle. They are made up of electrodes separated by a membrane, sandwiched in between two current collectors. The graphene-based supercapacitor innovation is built of nanoparticles such as metal, metal oxide and conducting polymer. It consists of activated carbon with low energy and power densities. It is made of flexible electrode materials which is suitable for energy-orientated industry. It also contains functional groups that are applicable in sensing platform and sensing-orientated industry. Replacement of the existing carbon activated electrode with these graphene-based nanocomposites will produce high efficient supercapacitors with long shelf-life.

ADVANTAGES

- High energy and power densities
- Has a long shelf-life
- Applicable for both energy and sensing orientated industry

INDUSTRY OVERVIEW

Prospects: Organizations having supercapacitor/storage device with high energy density, high power density and long life cycle (e.g. energy-oriented industry, sensing-oriented industry)

The global market for supercapacitors is estimated at USD470 million in 2010. Demand for supercapacitors is projected to continue growing at a very healthy rate during the next 5 years, reaching a value of USD1.2 billion in 2015, a compound annual growth rate (CAGR) of 20.6%. In 2010, the segments for supercapacitor market include the energy sector and transportation. Energy sector holds 17.5% of the total market, with total revenues of USD82 million and projected to increase at a 13.5% compound annual growth rate (CAGR) to reach USD611 million in 2015. The transportation sector holds 13.5% share, and projected to increase at a 34.8% compound annual growth rate (CAGR) to reach USD282 million in 2015.

Dr. Janet Lim Hong Ngee
Faculty of Science
hongngee@upm.edu.my