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DESIGN AND DEVELOPMENT OF GRAPHENE-BASED BATTERY FOR ROBOTS

Abstract

To propose a new type of battery for planetary flight and robots. Graphene-based batteries is an emerging technology that allows for increased electrode density, faster cycle times, as well as helps to process the ability to hold the charge for longer times and helps to improve the battery's lifespan. Graphene is an ideal conductor of electricity, which allows electricity to flow without hindrance. In the entire type of capacitors, graphene has shown the most potential in supercapacitors as it can be used in the carbon coatings on the capacitor plates to form an efficient double layer coating. These supercapacitors can then be used to store large amounts of energy. And by consolidating graphene-based supercapacitors into Li-ion modules, we can increase the lightweight, energy density, charge and discharge cycle rates, and stability against the appropriate individual constituents. It has been verified and proved that Graphene batteries have a much higher capacity on average than lithium-ion batteries, even at smaller sizes. Lithium-ion batteries can store up to 180Wh per kilogram, while graphene can store up to 1,000Wh per kilogram, making it a space-efficient store of energy. Not only are these graphene batteries safer in the event of a crash, but also it can provide a longer range on a single charge than a smaller or lighter battery. Due to their flat structure, these batteries can even charge much faster and dematerialize excess heat more productively. In former times, Scientists have been able to create supercapacitors that are able to store 150 Fg-1 However, some have suggested that the theoretical upper limit for graphene-based supercapacitors is 550 Fg-1. CNT can be employed in the graphene matrix in either two or three dimensions, with an average specific capacitance of 120 Fg-1 and 386 Fg-1, respectively. In the three-dimensional graphene-CNT, the capacitance can even increase by up to 20 percent after 2000 cycles, showing that these electrodes have excellent electrochemical stability. Graphene-sulphur composite showed high and stable specific capacities up to 600mAh/g over more than 100 cycles, representing a promising cathode material for rechargeable lithium batteries with high energy density. And by this, the weight can be reduced without compromising the power rather than increasing the power and flight time. This is an upgraded version of the current battery which can reduce the charging time, have the strongest tensile strength, is extremely flexible, and give effective power.