Graphene-based ternary composites for supercapacitors

ABSTRACT

The research on electrode materials for supercapacitor application continues to evolve as the request of high-energy storage system has increased globally due to the demand for energy consumption. Over the past decades, various types of carbon-based materials have been employed as electrode materials for high-performance supercapacitor application. Among them, graphene is 1 of the most widely used carbon-based materials due to its excellent properties including high surface area and excellent conductivity. To exploit more of its interesting properties, graphene is tailored to produce graphene oxide and reduced graphene oxide to improve the dispersibility in water and easy to be incorporated with other materials to form binary composites or even ternary composites. Nowadays, ternary composites have attracted enormous interest as 2 materials (binary composites) cannot satisfy the requirement of the high-performance supercapacitor. Thus, many approaches have been employed to fabricate ternary composites by combining 3 different types of electroactive materials for high-performance supercapacitor application. This review focuses on the supercapacitive performance of graphene-based ternary composites with different types of active materials, ie, conducting polymers, metal oxide, and other carbon-based materials.

Keyword: Graphene-based ternary composites; Supercapacitor; Energy consumption