Three-dimensional graphene anchored Fe2O3@C core-shell nanoparticles as supercapacitor electrodes

Three-dimensional (3D) reduced graphene oxide (rGO) anchored carbon-coated Fe2O3 core-shell nanoparticles (Fe2O3@C-rGO) has been developed successfully through a simple one-pot hydrothermal process followed by a further annealing treatment. The 3D Fe2O3@C-rGO nanocomposite consists of carbon-coated Fe2O3 nanoparticle clusters (Fe2O3@C) and rGO nanosheets. The homogenously distributed and intercalated Fe2O3@C nanoparticles between rGO nanosheets form a highly conductive 3D carbon network with rGO, and present a hierarchical pore size structure, enabling fast ion and electron transport, as well as remarkable specific surface area. The electrochemical performance in supercapacitor has been characterized, and the as-prepared Fe2O3@C-rGO electrode shows a significant high specific capacitance of 211.4 F/g at 0.5 A/g and 177.2 F/g at 20 A/g with no visible performance decay even after 2500 cycles testing. These properties indicate a good potential to achieve high performance electrochemical devices.

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Proton conductors, Tianjin University
Contributors: Zhang, M., Sha, J., Miao, X., Liu, E., Shi, C., Li, J., He, C., Li, Q., Zhao, N.
Number of pages: 8
Pages: 956-963
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Journal of Alloys and Compounds
Volume: 696
ISSN (Print): 0925-8388
Ratings:
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 3.66 SJR 1.02 SNIP 1.403
Web of Science (2017): Impact factor 3.779
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.05 SJR 0.954 SNIP 1.332
Web of Science (2016): Impact factor 3.133
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 3.03 SJR 0.957 SNIP 1.398
Web of Science (2015): Impact factor 3.014
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 3.13 SJR 1.117 SNIP 1.632
Web of Science (2014): Impact factor 2.999
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.73 SJR 1.059 SNIP 1.583
Web of Science (2013): Impact factor 2.726
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.43 SJR 1.246 SNIP 1.57
Web of Science (2012): Impact factor 2.39
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 2.41 SJR 1.164 SNIP 1.463