
What Does Analysis of Nanotechnology Hot Papers of 2018 Tell Us?

2019-02-12

As reported by StatNano, a total of 222 nanotechnology-related hot papers were published in 2018, in whose publication Chinese and American universities have the largest shares. Environmental and energy-related issues are among the most important subjects investigated in these articles; graphene and its derivatives also account for the highest proportion of the nanomaterials used for these studies.

Hot papers are the papers that have been published in the past two years and ranked in the top 0.1% of all papers in a scientific field due to their outstandingly large number of citations received during the past two months; therefore, the list of these papers is not fixed and may change over time.

According to StatNano, of all the nanotechnology papers published in 2018, 222 are considered as hot papers in the last two months. These papers have been cited more than 8,000 times altogether – i.e. each paper has received 36 citations on average over this one-year period. The most frequently cited paper, “Unconventional superconductivity in magic-angle graphene superlattices”, has been published in Nature by the researchers of the Massachusetts Institute of Technology (MIT) and Harvard in the field of physics, and it has so far been cited 170 times since its publication in April 2018. The second most frequently cited paper of 2018 has also been published by the same group on graphene superconductors in the same journal, which has so far received 103 citations.

Nearly more than half of the 100 universities and research centers involved in the publication of these articles are from [China](#), among which the Chinese Academy of Sciences with 27, and the University of Electronic Science and Technology of [China](#) with 13 hot papers have the greatest shares. The Chinese Academy of Sciences, having 114 institutes throughout [China](#), is the largest academic organization in the natural sciences, technology, and research and development of this country, ranked above MIT and the Max Planck Society in the annual Nature Index ranking. After [China](#), the [United States](#) with more than 20 universities takes the second place on the list, among which the University of Tennessee, MIT, and Harvard

University have the largest shares. The list also includes universities from other countries such as [Japan](#), [Canada](#), [Singapore](#), [France](#), [Iran](#), and [Saudi Arabia](#).

Of these 222 hot papers, 98 are in the field of chemistry, which have sent the Chemical Engineering Journal with 14 hot papers to the first spot on the list of the publishers of these papers. The second and third places of the list are held by Science with 10 and Nature with 9 hot papers. Table 1 lists the statistics for some of these journals.

Table 1. Journals having published most of the nanotechnology hot papers of 2018

Journals	Number of Hot Papers Published in 2018
Chemical Engineering Journal	14
International Journal of Heat and Mass Transfer	12
Advanced Materials	11
Applied Catalysis B Environmental	11
Science	10
ACS Sustainable Chemistry Engineering	9
Nature	9
Journal of Molecular Liquids	8
Advanced Energy Materials	6
Nature Nanotechnology	6
Energy Environmental Science	5
Journal of the American Chemical Society	5
Biosensors Bioelectronics	4
Journal of Materials Chemistry A	4
Nature Communications	4

Graphene and its derivatives have the highest proportion of the nanomaterials used in these hot papers. Since 2006 the number of articles on graphene has exponentially grown, in so far as it has increased from 3,200 articles in 2010 to more than 27,000 articles in 2017 [1]. Hence, graphene and its derivatives can be considered among the most important fundamental materials in nanotechnology, to which a significant amount of research has recently been dedicated. In addition to graphene, nanomaterials such as nanowires, nanofluids, nanopores, quantum dots, and the nanoparticles of BN, NaBiF₄, TiO₂, ZnO, and Ag are seen among the materials widely used in the hot papers.

The nanotechnology hot papers of 2018 cover a wide range of subjects such as cancer

detection, light-emitting diodes, quantum computing, gas sensors, optoelectronics, neuroscience, genomic sequencing, and aerospace; the elimination of environmental pollutants as well as energy especially in the field of solar cell, however, comprise the largest proportion of the hot papers, which underscores the globally crucial importance of environmental and energy-related issues. Table 2 shows the most frequently cited hot paper of each scientific field in 2018.

Table 2. The most frequently cited hot papers in different scientific fields in 2018

Area	Subject	Nanomaterials	Journal	IF
Title: Unconventional superconductivity in magic-angle graphene superlattices				
Physics	Superconductivity	Graphene	Nature	41.6
Title: Metal-organic framework-based materials: superior adsorbents for the capture of toxic and radioactive metal ions				
Chemistry	Environmental pollution management	Graphene oxide	Chemical Society Reviews	40.2
Title: Significantly enhanced and precisely modeled thermal conductivity in polyimide nanocomposites with chemically modified graphene via in situ polymerization and electrospinning-hot press technology				
Materials Science	Electrospinning	Graphene nanocomposite	Journal Of Materials Chemistry C	5.9
Title: Boron nitride-based materials for the removal of pollutants from aqueous solutions: A review				
Engineering	Environmental pollution management	Boron nitride nanoparticles	Chemical Engineering Journal	6.7
Title: Nanopore sequencing and assembly of a human genome with ultra-long reads				
Biology & Biochemistry	Genome sequencing	Nanopore	Nature Biotechnology	35.7
Title: Near-Infrared-to-Ultraviolet Light-Mediated Photoelectrochemical Aptasensing Platform for Cancer Biomarker Based on Core Shell NaYF ₄ :Yb,Tm@TiO ₂ Upconversion Microrods				
Chemistry / Medicine	Cancer detection	Upconversion nanoparticles	Analytical Chemistry	6.1
Title: Near-infrared deep brain stimulation via upconversion nanoparticle-mediated optogenetics				
Neuroscience & Behavior	Neuroscience	Upconversion nanoparticles	Science	41.1
Title: 3D-2D-0D Interface Profiling for Record Efficiency All-Inorganic CsPbBr ₂ Perovskite Solar Cells with Superior Stability				
Energy Fuel	Perovskite solar cell	Quantum dots	Advanced Energy Materials	21.9