Phosphorus-doped graphite layers with high electrocatalytic activity for the O2 reduction in an alkaline medium

DOI: 10.1002/anie.201006768
Angewandte Chemie - International Edition, 2011, 50, 3257-61

#	Paper	IF	Citations
612	Novel phosphorus-doped multiwalled nanotubes with high electrocatalytic activity for O2 reduction in alkaline medium. **2011**, 16, 35-38		109
611	Nanoporous graphitic-C3N4@carbon metal-free electrocatalysts for highly efficient oxygen reduction. **2011**, 133, 20116-9		869
610	Contrast and Synergy between Electrocatalysis and Heterogeneous Catalysis. **2011**, 2011, 1-18		16
609	Non-Metal Doped Pd/CNTs Catalysts for Oxygen Reduction Reaction in Alkaline Medium. **2012**, 550-553, 238-242		1
608	Characterization of phosphorus-doped multiwalled carbon nanotubes. **2012**, 111, 064315		24
607	Graphene-based materials for energy applications. **2012**, 37, 1265-1272		113
606	Single-step synthetic approach for boron-doped carbons as a non-precious catalyst for oxygen reduction in alkaline medium. **2012**, 25, 101-104		63
605	Graphyne As a Promising Metal-Free Electrocatalyst for Oxygen Reduction Reactions in Acidic Fuel Cells: A DFT Study. **2012**, 116, 20472-20479		97
604	Carbon nanomaterials as metal-free catalysts in next generation fuel cells. **2012**, 1, 514-517		176
603	Biomimetic Oxygen Activation by MoS2/Ta3N5 Nanocomposites for Selective Aerobic Oxidation. **2012**, 124, 11910-11914		16
602	Biomimetic oxygen activation by MoS2/Ta3N5 nanocomposites for selective aerobic oxidation. *Angewandte Chemie - International Edition*, **2012**, 51, 11740-4	16.4	56
601	Design of Pt catalyst with high electrocatalytic activity and well tolerance to methanol for oxygen reduction in acidic medium. **2012**, 29, 11-14		17
600	Wet chemical synthesis of nitrogen-doped graphene towards oxygen reduction electrocatalysts without high-temperature pyrolysis. **2012**, 22, 6575		257
599	Phosphorus□itrogen dual doped carbon as an effective catalyst for oxygen reduction reaction in acidic media: effects of the amount of P-doping on the physical and electrochemical properties of carbon. **2012**, 22, 12107		191
598	Polybenzimidazole mediated N-doping along the inner and outer surfaces of a carbon nanofiber and its oxygen reduction properties. **2012**, 22, 23668		13
597	Unique reactivity of Fe nanoparticles-defective graphene composites toward NH(x) (x = 0, 1, 2, 3) adsorption: a first-principles study. **2012**, 14, 15036-45		28
596	Phosphorus-doped ordered mesoporous carbons with different lengths as efficient metal-free electrocatalysts for oxygen reduction reaction in alkaline media. **2012**, 134, 16127-30		784

595	Vertically Aligned Carbon Nanotube Arrays Co-doped with Phosphorus and Nitrogen as Efficient Metal-Free Electrocatalysts for Oxygen Reduction. **2012**, 3, 2863-70		269
594	Binary and ternary doping of nitrogen, boron, and phosphorus into carbon for enhancing electrochemical oxygen reduction activity. **2012**, 6, 7084-91		701
593	Nitrogen doped large mesoporous carbon for oxygen reduction electrocatalyst using DNA as carbon and nitrogen precursor. **2012**, 21, 5-8		36
592	Highly air-stable phosphorus-doped n-type graphene field-effect transistors. **2012**, 24, 5481-6		177
591	A nitrogen-doped polyaniline carbon with high electrocatalytic activity and stability for the oxygen reduction reaction in fuel cells. **2012**, 5, 1698-702		39
590	Nanostructured metal-free electrochemical catalysts for highly efficient oxygen reduction. **2012**, 8, 3550-66		518
589	Graphene enriched with pyrrolic coordination of the doped nitrogen as an efficient metal-free electrocatalyst for oxygen reduction. **2012**, 22, 23506		143
588	Catalyst-free synthesis of iodine-doped graphene via a facile thermal annealing process and its use for electrocatalytic oxygen reduction in an alkaline medium. **2012**, 48, 1027-9		305
587	Metal-free selenium doped carbon nanotube/graphene networks as a synergistically improved cathode catalyst for oxygen reduction reaction. **2012**, 4, 6455-60		189
586	Structural Selectivity of CO Oxidation on Fe/N/C Catalysts. **2012**, 116, 17572-17579		49
585	Disordered Brownmillerite Ba2InCeO5+□with Enhanced Oxygen Reduction Activity. **2012**, 24, 2823-2828		22
584	Potential dependent and structural selectivity of the oxygen reduction reaction on nitrogen-doped carbon nanotubes: a density functional theory study. **2012**, 14, 11715-23		48
583	Porous Pt-Ni-P composite nanotube arrays: highly electroactive and durable catalysts for methanol electrooxidation. **2012**, 134, 5730-3		345
582	Sulfur-doped graphene as an efficient metal-free cathode catalyst for oxygen reduction. **2012**, 6, 205-11		1580
581	BCN Graphene as Efficient Metal-Free Electrocatalyst for the Oxygen Reduction Reaction. **2012**, 124, 4285-4288		151
580	BCN graphene as efficient metal-free electrocatalyst for the oxygen reduction reaction. *Angewandte Chemie - International Edition*, **2012**, 51, 4209-12	16.4	996
579	Confined iron nanowires enhance the catalytic activity of carbon nanotubes in the aerobic oxidation of cyclohexane. **2012**, 5, 1213-7		48
578	Enhanced methanol oxidation activity of Pt catalyst supported on the phosphorus-doped multiwalled carbon nanotubes in alkaline medium. **2012**, 22, 34-38		28

577	Pt supported on phosphorus-doped carbon nanotube as an anode catalyst for direct methanol fuel cells. **2012**, 16, 73-76	61
576	Synthesis of phosphorus-doped graphene and its multifunctional applications for oxygen reduction reaction and lithium ion batteries. **2013**, 25, 4932-7	810
575	Doping carbons beyond nitrogen: an overview of advanced heteroatom doped carbons with boron, sulphur and phosphorus for energy applications. **2013**, 6, 2839	1320
574	A Novel Carbon-Encapsulated Cobalt-Tungsten Carbide as Electrocatalyst for Oxygen Reduction Reaction in Alkaline Media. **2013**, 13, 387-391	29
573	N-doped graphene natively grown on hierarchical ordered porous carbon for enhanced oxygen reduction. **2013**, 25, 6226-31	358
572	Phosphorus-doped porous carbons as efficient electrocatalysts for oxygen reduction. **2013**, 1, 9889	193
571	Microwave-Assisted One-Pot Synthesis of Metal-Free Nitrogen and Phosphorus Dual-Doped Nanocarbon for Electrocatalysis and Cell Imaging. **2013**, 30, 557-564	61
570	Two-Step Boron and Nitrogen Doping in Graphene for Enhanced Synergistic Catalysis. **2013**, 125, 3192-3198	332
569	Covalent functionalization based heteroatom doped graphene nanosheet as a metal-free electrocatalyst for oxygen reduction reaction. **2013**, 5, 12255-60	61
568	Sulfur and nitrogen co-doped carbon nanotubes for enhancing electrochemical oxygen reduction activity in acidic and alkaline media. **2013**, 1, 14853	173
567	Doped-carbon electrocatalysts with trimodal porosity from a homogeneous polypeptide gel. **2013**, 1, 13576	44
566	Synergistic increase of oxygen reduction favourable Fe-N coordination structures in a ternary hybrid of carbon nanospheres/carbon nanotubes/graphene sheets. **2013**, 15, 18482-90	38
565	P-doped graphene obtained by pyrolysis of modified alginate as a photocatalyst for hydrogen generation from water-methanol mixtures. *Angewandte Chemie - International Edition*, **2013**, 52, 11813-6 16.4	221
564	N-heterocycles tethered graphene as efficient metal-free catalysts for an oxygen reduction reaction in fuel cells. **2013**, 1, 10166	13
563	Highly active reduction of oxygen on a FeCo alloy catalyst encapsulated in pod-like carbon nanotubes with fewer walls. **2013**, 1, 14868	183
562	Toward understanding the active site for oxygen reduction reaction on phosphorus-encapsulated single-walled carbon nanotubes. **2013**, 3, 5577	22
561	Recent progress in nanostructured electrocatalysts for PEM fuel cells. **2013**, 1, 4631	157
560	Electrochemically reduced graphene oxide multilayer films as metal-free electrocatalysts for oxygen reduction. **2013**, 1, 1415-1420	43

559	Electrocatalysis of oxygen reduction on nitrogen-containing multi-walled carbon nanotube modified glassy carbon electrodes. **2013**, 87, 709-716		100
558	B, N- and P, N-doped graphene as highly active catalysts for oxygen reduction reactions in acidic media. **2013**, 1, 3694		355
557	Performance of polyaniline-derived Fe-N-C catalysts for oxygen reduction reaction in alkaline electrolyte. **2013**, 34, 1992-1997		24
556	A mini review on carbon-based metal-free electrocatalysts for oxygen reduction reaction. **2013**, 34, 1986-1991		39
555	Sulfur-doped ordered mesoporous carbon with high electrocatalytic activity for oxygen reduction. **2013**, 108, 404-411		110
554	Sulfur-nitrogen co-doped three-dimensional carbon foams with hierarchical pore structures as efficient metal-free electrocatalysts for oxygen reduction reactions. **2013**, 5, 3283-8		278
553	Two-step boron and nitrogen doping in graphene for enhanced synergistic catalysis. *Angewandte Chemie - International Edition*, **2013**, 52, 3110-6	16.4	776
552	Recent progress in doped carbon nanomaterials as effective cathode catalysts for fuel cell oxygen reduction reaction. **2013**, 236, 238-249		408
551	Enhanced electrochemical oxygen reduction reaction by restacking of N-doped single graphene layers. **2013**, 3, 4246		30
550	Metal-Free Electrocatalysts for Oxygen Reduction. **2013**, 375-389		3
549	Promises and Challenges of Unconventional Electrocatalyst Supports. **2013**, 689-728		2
548	Tuning nanoparticle catalysis for the oxygen reduction reaction. *Angewandte Chemie - International Edition*, **2013**, 52, 8526-44	16.4	808
547	Doping of chalcogens (sulfur and/or selenium) in nitrogen-doped graphene□CNT self-assembly for enhanced oxygen reduction activity in acid media. **2013**, 3, 12417		47
546	Biomass-derived activated carbon as high-performance non-precious electrocatalyst for oxygen reduction. **2013**, 3, 12039		68
545	Phosphorus-doped graphene nanosheets as efficient metal-free oxygen reduction electrocatalysts. **2013**, 3, 9978		317
544	Sulfur and nitrogen co-doped, few-layered graphene oxide as a highly efficient electrocatalyst for the oxygen-reduction reaction. **2013**, 6, 493-9		223
543	Nanocarbons for the development of advanced catalysts. **2013**, 113, 5782-816		1005
542	Ordered mesoporous boron-doped carbons as metal-free electrocatalysts for the oxygen reduction reaction in alkaline solution. **2013**, 15, 2459-65		114

541	Nitrogen-, phosphorous- and boron-doped carbon nanotubes as catalysts for the aerobic oxidation of cyclohexane. **2013**, 57, 433-442		176
540	Can Si-doped graphene activate or dissociate O2 molecule?. **2013**, 39, 126-32		56
539	Facile, scalable synthesis of edge-halogenated graphene nanoplatelets as efficient metal-free eletrocatalysts for oxygen reduction reaction. **2013**, 3, 1810		278
538	Low-temperature synthesis of nitrogen/sulfur co-doped three-dimensional graphene frameworks as efficient metal-free electrocatalyst for oxygen reduction reaction. **2013**, 62, 296-301		374
537	Sulfur-containing carbon by flame synthesis as efficient metal-free electrocatalyst for oxygen reduction reaction. **2013**, 30, 9-12		98
536	Nitrogen- and phosphorus-co-doped carbons with tunable enhanced surface areas promoted by the doping additives. **2013**, 49, 1208-10		124
535	Sulfur- and nitrogen-doped, ferrocene-derived mesoporous carbons with efficient electrochemical reduction of oxygen. **2013**, 5, 12594-601		72
534	The Effect of Metal Catalyst on the Electrocatalytic Activity of Nitrogen-Doped Carbon Nanotubes. **2013**, 117, 25213-25221		34
533	Functionalization of graphene for efficient energy conversion and storage. **2013**, 46, 31-42		668
532	P-Doped Graphene Obtained by Pyrolysis of Modified Alginate as a Photocatalyst for Hydrogen Generation from Water□Methanol Mixtures. **2013**, 125, 12029-12032		22
531	Mechanistic insight into the catalytic oxidation of cyclohexane over carbon nanotubes: kinetic and in situ spectroscopic evidence. **2013**, 19, 9818-24		35
530	Optimierte Nanopartikel-Katalyse f□ die Sauerstoffreduktionsreaktion. **2013**, 125, 8686-8705		105
529	Nitrogen-doped carbon nanosheets with size-defined mesopores as highly efficient metal-free catalyst for the oxygen reduction reaction. *Angewandte Chemie - International Edition*, **2014**, 53, 1570-4	16.4	428
528	Electrochemical preparation of N-doped cobalt oxide nanoparticles with high electrocatalytic activity for the oxygen-reduction reaction. **2014**, 20, 3457-62		32
527	Highly nitrogen-doped mesoscopic carbons as efficient metal-free electrocatalysts for oxygen reduction reactions. **2014**, 2, 20030-20037		34
526	Phosphorus-doped carbon nanotubes supported low Pt loading catalyst for the oxygen reduction reaction in acidic fuel cells. **2014**, 268, 171-175		53
525	Sulfur-doped carbons prepared from eutectic mixtures containing hydroxymethylthiophene as metal-free oxygen reduction catalysts. **2014**, 7, 3347-55		15
524	Tuning nondoped carbon nanotubes to an efficient metal-free electrocatalyst for oxygen reduction reaction by localizing the orbital of the nanotubes with topological defects. **2014**, 6, 14262-9		33

523	Graphene-based nanocomposites for energy storage and conversion in lithium batteries, supercapacitors and fuel cells. **2014**, 2, 15-32	375
522	Uniform nitrogen and sulfur co-doped carbon nanospheres as catalysts for the oxygen reduction reaction. **2014**, 69, 294-301	98
521	A simple and green pathway toward nitrogen and sulfur dual doped hierarchically porous carbons from ionic liquids for oxygen reduction. **2014**, 259, 138-144	57
520	Synthesis and electrocatalytic activity of phosphorus-doped carbon xerogel for oxygen reduction. **2014**, 127, 53-60	78
519	Highly efficient metal-free phosphorus-doped platelet ordered mesoporous carbon for electrocatalytic oxygen reduction. **2014**, 67, 736-743	127
518	Synthesis and electrocatalytic activity of phosphorus and Co co-doped mesoporous carbon for oxygen reduction. **2014**, 42, 46-49	35
517	Doped graphene for metal-free catalysis. **2014**, 43, 2841-57	608
516	Large scale production of biomass-derived N-doped porous carbon spheres for oxygen reduction and supercapacitors. **2014**, 2, 3317	179
515	Nitrogen-Doped Carbon Nanosheets with Size-Defined Mesopores as Highly Efficient Metal-Free Catalyst for the Oxygen Reduction Reaction. **2014**, 126, 1596-1600	208
514	Highly graphitized nitrogen-doped porous carbon nanopolyhedra derived from ZIF-8 nanocrystals as efficient electrocatalysts for oxygen reduction reactions. **2014**, 6, 6590-602	594
513	Phosphorus-doped reduced graphene oxide as an electrocatalyst counter electrode in dye-sensitized solar cells. **2014**, 263, 246-251	93
512	Pt nanoparticles incorporated into phosphorus-doped ordered mesoporous carbons: enhanced catalytic activity for methanol electrooxidation. **2014**, 127, 307-314	46
511	Oxygen Reduction Reaction Studies of Phosphorus and Nitrogen Co-Doped Mesoporous Carbon Synthesized via Microwave Technique. **2014**, 1, 573-579	61
510	Ultra-high-performance doped carbon catalyst derived from o-phenylenediamine and the probable roles of Fe and melamine. **2014**, 158-159, 60-69	43
509	Nitrogen-doped graphene/carbon nanotube hybrids: in situ formation on bifunctional catalysts and their superior electrocatalytic activity for oxygen evolution/reduction reaction. **2014**, 10, 2251-9	525
508	Surrounding media sensitive photoluminescence of boron-doped graphene quantum dots for highly fluorescent dyed crystals, chemical sensing and bioimaging. **2014**, 70, 149-156	194
507	Heterogeneous nanocarbon materials for oxygen reduction reaction. **2014**, 7, 576	792
506	Facile synthesis of P-doped carbon quantum dots with highly efficient photoluminescence. **2014**, 4, 5465	148

505	Low-temperature and one-pot synthesis of sulfurized graphene nanosheets via in situ doping and their superior electrocatalytic activity for oxygen reduction reaction. **2014**, 2, 20714-20722		48
504	Toward Full Exposure of "Active Sites" Nanocarbon Electrocatalyst with Surface Enriched Nitrogen for Superior Oxygen Reduction and Evolution Reactivity. **2014**, 24, 5956-5961		300
503	The role of the central Fe atom in the N4-macrocyclic structure for the enhancement of oxygen reduction reaction in a heteroatom nitrogen-carbon nanosphere. **2014**, 16, 14905-11		51
502	Phosphorus-doped carbon supports enhance gold-based catalysts for acetylene hydrochlorination. **2014**, 4, 15877-15885		52
501	Phosphorus-doped macroporous carbon spheres for high efficiency selective oxidation of cyclooctene by air. **2014**, 4, 22419		10
500	Microwave assisted synthesis and characterization of silicon and phosphorous co-doped carbon as an electrocatalyst for oxygen reduction reaction. **2014**, 4, 6306		27
499	Metal-free Ketjenblack incorporated nitrogen-doped carbon sheets derived from gelatin as oxygen reduction catalysts. **2014**, 14, 1870-6		134
498	Phosphorus-doped graphene-wrapped molybdenum disulfide hollow spheres as anode material for lithium-ion batteries. **2014**, 4, 50529-50535		28
497	Synthesis of nitrogen-doped mesoporous carbon spheres with extra-large pores through assembly of diblock copolymer micelles. *Angewandte Chemie - International Edition*, **2015**, 54, 588-93	16.4	185
496	From two-dimension to one-dimension: the curvature effect of silicon-doped graphene and carbon nanotubes for oxygen reduction reaction. **2014**, 16, 17479-86		42
495	Ionic liquid derived carbons as highly efficient oxygen reduction catalysts: first elucidation of pore size distribution dependent kinetics. **2014**, 50, 1469-71		46
494	Synthesis and oxygen reduction properties of three-dimensional sulfur-doped graphene networks. **2014**, 50, 6382-5		115
493	P/N/O co-doped carbonaceous material based supercapacitor with voltage up to 1.9 V in aqueous electrolyte. **2014**, 4, 55971-55979		17
492	Mesoporous carbon material co-doped with nitrogen and iron (Fe/N/C): high-performance cathode catalyst for oxygen reduction reaction in alkaline electrolyte. **2014**, 2, 8617-8622		80
491	2D polyacrylonitrile brush derived nitrogen-doped carbon nanosheets for high-performance electrocatalysts in oxygen reduction reaction. **2014**, 5, 2057-2064		49
490	Phosphorus and nitrogen dual-doped few-layered porous graphene: a high-performance anode material for lithium-ion batteries. **2014**, 6, 14415-22		191
489	Hybrid electrolyte Li-air rechargeable batteries based on nitrogen- and phosphorus-doped graphene nanosheets. **2014**, 4, 13119-13122		16
488	Nitrogen self-doped porous carbon from surplus sludge as metal-free electrocatalysts for oxygen reduction reactions. **2014**, 6, 14911-8		50

487	Hydrothermal transformation of dried grass into graphitic carbon-based high performance electrocatalyst for oxygen reduction reaction. **2014**, 10, 3371-8	122
486	A self-sponsored doping approach for controllable synthesis of S and N co-doped trimodal-porous structured graphitic carbon electrocatalysts. **2014**, 7, 3720-3726	180
485	Metal-free doped carbon materials as electrocatalysts for the oxygen reduction reaction. **2014**, 2, 4085-4110	608
484	Additional doping of phosphorus into polypyrrole functionalized nitrogenous carbon nanotubes as novel metal-free oxygen reduction electrocatalyst in alkaline solution. **2014**, 39, 15464-15473	26
483	Structuring Porous Iron-Nitrogen-Doped Carbon in a Core/Shell Geometry for the Oxygen Reduction Reaction. **2014**, 4, 1400840	68
482	A Theoretical Study of Molecular Oxygen Chemisorption on N, B, or O Doped Carbon Edge Sites. **2014**, 14, 709-719	4
481	Heteroatom-doped graphene materials: syntheses, properties and applications. **2014**, 43, 7067-98	1258
480	MoO2 nanobelts@nitrogen self-doped MoS2 nanosheets as effective electrocatalysts for hydrogen evolution reaction. **2014**, 2, 11358	232
479	Nanowire-directed templating synthesis of metal-organic framework nanofibers and their derived porous doped carbon nanofibers for enhanced electrocatalysis. **2014**, 136, 14385-8	506
478	Uranium- and thorium-doped graphene for efficient oxygen and hydrogen peroxide reduction. **2014**, 8, 7106-14	64
477	Oxygen reduction reaction by electrochemically reduced graphene oxide. **2014**, 173, 415-28	65
476	Modified Carbon Materials for O2 Reduction Reaction Electrocatalysts in Acid PEM Fuel Cells. **2014**, 119-156	3
475	Tailored design of functional nanoporous carbon materials toward fuel cell applications. **2014**, 9, 305-323	230
474	Recent progress on graphene-based hybrid electrocatalysts. **2014**, 1, 379-399	277
473	Phosphorus-doped carbon derived from cellulose phosphate as efficient catalyst for air-cathode in microbial fuel cells. **2014**, 261, 245-248	48
472	Toward design of synergistically active carbon-based catalysts for electrocatalytic hydrogen evolution. **2014**, 8, 5290-6	802
471	A transformative route to nanoporous manganese oxides of controlled oxidation states with identical textural properties. **2014**, 2, 10435-10443	79
470	Carbon black/sulfur-doped graphene composite prepared by pyrolysis of graphene oxide with sodium polysulfide for oxygen reduction reaction. **2014**, 142, 51-60	26

469	Abiotic Oxygen Reduction Reaction Catalysts Used in Microbial Fuel Cells. **2014**, 1, 1813-1821	96
468	One-pot synthesis of nitrogen and sulfur co-doped onion-like mesoporous carbon vesicle as an efficient metal-free catalyst for oxygen reduction reaction in alkaline solution. **2014**, 272, 267-276	59
467	Graphene-supported nanoelectrocatalysts for fuel cells: synthesis, properties, and applications. **2014**, 114, 5117-60	790
466	Heteroatom doped mesoporous carbon/graphene nanosheets as highly efficient electrocatalysts for oxygen reduction. **2014**, 421, 160-4	23
465	Nitrogen and phosphorus dual-doped hierarchical porous carbon foams as efficient metal-free electrocatalysts for oxygen reduction reactions. **2014**, 20, 3106-12	169
464	Synthesis, properties and applications of graphene doped with boron, nitrogen and other elements. **2014**, 9, 324-343	304
463	Electrocatalytic activity of carbon nanoparticles from diffusion flame towards oxygen reduction. **2014**, 136, 176-181	8
462	Doping of Graphene by Nitrogen, Boron, and Other Elements. **2014**, 283-358	5
461	Enhanced Oxygen Reduction Activities of Pt Supported on Nitrogen-Doped Carbon Nanocapsules. **2014**, 137, 41-48	18
460	The value of mixed conduction for oxygen electroreduction on graphene–chitosan composites. **2014**, 73, 234-243	13
459	From Cyano-aromatic Molecules to Nitrogen-doped Carbons by Solution Plasma for the Oxygen Reduction Reaction in Alkaline Medium. **2015**, 2, 4302-4308	5
458	Spectroscopic Analysis of Nanocarbon-Based non-precious Metal Catalyst for ORR. **2015**, 117-148	
457	Enhanced hydrogen desorption properties of magnesium hydride by coupling non-metal doping and nano-confinement. **2015**, 107, 243907	27
456	Multifunctional graphene-based nanostructures for efficient electrocatalytic reduction of oxygen. **2015**, 90, 2132-2151	20
455	Synthesis of Nitrogen-Doped Mesoporous Carbon Spheres with Extra-Large Pores through Assembly of Diblock Copolymer Micelles. **2015**, 127, 598-603	94
454	One-pot Synthesis of Nitrogen and Phosphorus Co-doped Graphene and Its Use as High-performance Electrocatalyst for Oxygen Reduction Reaction. **2015**, 10, 2609-14	32
453	Structural Origin of the Activity in Mn3O4-Graphene Oxide Hybrid Electrocatalysts for the Oxygen Reduction Reaction. **2015**, 8, 3331-9	52
452	Design Principles for Heteroatom-Doped Carbon Nanomaterials as Highly Efficient Catalysts for Fuel Cells and Metal-Air Batteries. **2015**, 27, 6834-40	389

451	Hydrophilic Nitrogen and Sulfur Co-doped Molybdenum Carbide Nanosheets for Electrochemical Hydrogen Evolution. **2015**, 11, 6278-84		137
450	Designing a Highly Active Metal-Free Oxygen Reduction Catalyst in Membrane Electrode Assemblies for Alkaline Fuel Cells: Effects of Pore Size and Doping-Site Position. *Angewandte Chemie - International Edition*, **2015**, 54, 9230-4	16.4	105
449	Designing a Highly Active Metal-Free Oxygen Reduction Catalyst in Membrane Electrode Assemblies for Alkaline Fuel Cells: Effects of Pore Size and Doping-Site Position. **2015**, 127, 9362-9366		9
448	Direct Synthesis of Phosphorus-Doped Mesoporous Carbon Materials for Efficient Electrocatalytic Oxygen Reduction. **2015**, 7, 2903-2909		58
447	Metal-Free Carbonaceous Materials as Promising Heterogeneous Catalysts. **2015**, 7, 2765-2787		98
446	The Effect of Different Phosphorus Chemical States on an Onion-like Carbon Surface for the Oxygen Reduction Reaction. **2015**, 8, 2872-6		20
445	A Discussion on the Activity Origin in Metal-Free Nitrogen-Doped Carbons For Oxygen Reduction Reaction and their Mechanisms. **2015**, 8, 2772-88		97
444	On the Role of Metals in Nitrogen-Doped Carbon Electrocatalysts for Oxygen Reduction. *Angewandte Chemie - International Edition*, **2015**, 54, 10102-20	16.4	514
443	Space-confinement-induced synthesis of hierarchically nanoporous carbon nanowires for the enhanced electrochemical reduction of oxygen. **2015**, 3, 7093-7099		18
442	Simple one-step synthesis of fluorine-doped carbon nanoparticles as potential alternative metal-free electrocatalysts for oxygen reduction reaction. **2015**, 3, 9972-9981		127
441	Si-doped carbon nanotubes as efficient metal-free electrocatalysts for O2 reduction in alkaline medium. **2015**, 158, 32-35		24
440	Phosphorus-doped porous carbon derived from rice husk as anode for lithium ion batteries. **2015**, 5, 55136-55142		33
439	Boron and phosphorous-doped graphene as a metal-free electrocatalyst for the oxygen reduction reaction in alkaline medium. **2015**, 5, 53637-53643		41
438	Layered SiC sheets: A promising metal-free catalyst for NO reduction. **2015**, 60, 132-41		14
437	Sulfur-doped graphene as a catalyst support: Influences of carbon black and ruthenium nanoparticles on the hydrogen evolution reaction performance. **2015**, 93, 762-773		56
436	Nitrogen and Phosphorus Dual-Doped Graphene/Carbon Nanosheets as Bifunctional Electrocatalysts for Oxygen Reduction and Evolution. **2015**, 5, 4133-4142		539
435	Nitrogen and Fluorine co-doped carbon catalyst with high oxygen reduction performance, prepared by pyrolyzing a mixture of melamine and PTFE. **2015**, 182, 963-970		21
434	Cheap carbon black-based high-performance electrocatalysts for oxygen reduction reaction. **2015**, 51, 1972-5		44

433	E. coli-derived carbon with nitrogen and phosphorus dual functionalities for oxygen reduction reaction. **2015**, 249, 228-235	12
432	Nitrogen- and Phosphorus-Doped Biocarbon with Enhanced Electrocatalytic Activity for Oxygen Reduction. **2015**, 5, 920-927	124
431	Polyoxometalate-functionalized nanocarbon materials for energy conversion, energy storage and sensor systems. **2015**, 8, 776-789	383
430	Novel silicon-doped, silicon and nitrogen-codoped carbon nanomaterials with high activity for the oxygen reduction reaction in alkaline medium. **2015**, 3, 3289-3293	60
429	N-doped hierarchically macro/mesoporous carbon with excellent electrocatalytic activity and durability for oxygen reduction reaction. **2015**, 86, 108-117	136
428	Facile synthesis of nitrogen and fluorine co-doped carbon materials as efficient electrocatalysts for oxygen reduction reactions in air-cathode microbial fuel cells. **2015**, 3, 6873-6877	62
427	Phosphorous, nitrogen co-doped carbon from spent coffee grounds for fuel cell applications. **2015**, 132, n/a-n/a	13
426	Electrochemical synthesis of sulfur-doped graphene sheets for highly efficient oxygen reduction. **2015**, 58, 417-424	16
425	Recent advancements in Pt and Pt-free catalysts for oxygen reduction reaction. **2015**, 44, 2168-201	1524
424	Recent Advances in Heteroatom-Doped Metal-Free Electrocatalysts for Highly Efficient Oxygen Reduction Reaction. **2015**, 6, 132-147	104
423	Graphene as Sensitizer. **2015**, 407-430	
422	Bioinspired synthesis of nitrogen/sulfur co-doped graphene as an efficient electrocatalyst for oxygen reduction reaction. **2015**, 279, 252-258	106
421	Nitrogen-doped carbon shell structure derived from natural leaves as a potential catalyst for oxygen reduction reaction. **2015**, 13, 518-526	118
420	Synthesis of graphene with both high nitrogen content and high surface area by annealing composite of graphene oxide and g-C3N4. **2015**, 12, 807-814	10
419	Nitrogen-Doped Carbon Nanodots@Nanospheres as An Efficient Electrocatalyst for Oxygen Reduction Reaction. **2015**, 165, 7-13	32
418	CHAPTER 6:Doped Nanostructured Carbon Materials as Catalysts. **2015**, 268-311	2
417	Preparation of low-platinum-content platinum–nickel, platinum–cobalt binary alloy and platinum–nickel–cobalt ternary alloy catalysts for oxygen reduction reaction in polymer electrolyte fuel cells. **2015**, 294, 420-429	31
416	Recycling the biowaste to produce nitrogen and sulfur self-doped porous carbon as an efficient catalyst for oxygen reduction reaction. **2015**, 16, 408-418	105

415	One-step nanocasting synthesis of sulfur and nitrogen co-doped ordered mesoporous carbons as efficient electrocatalysts for oxygen reduction. **2015**, 159, 280-283	13
414	Customized casting of unstacked graphene with high surface area (>1300 m2g□1) and its application in oxygen reduction reaction. **2015**, 93, 702-712	17
413	MnCo2O4 Anchored on P-Doped Hierarchical Porous Carbon as an Electrocatalyst for High-Performance Rechargeable Li□O2 Batteries. **2015**, 5, 4890-4896	97
412	Nitrogen-doped hierarchical porous carbon microsphere through KOH activation for supercapacitors. **2015**, 452, 54-61	74
411	Nitrogen, phosphorus and iron doped carbon nanospheres with high surface area and hierarchical porous structure for oxygen reduction. **2015**, 288, 253-260	44
410	A systematic study of metal-supported boron nitride materials for the oxygen reduction reaction. **2015**, 17, 12722-7	58
409	Synergistic enhancement of nitrogen and sulfur co-doped graphene with carbon nanosphere insertion for the electrocatalytic oxygen reduction reaction. **2015**, 3, 7727-7731	52
408	N-doped carbon nanomaterials are durable catalysts for oxygen reduction reaction in acidic fuel cells. **2015**, 1, e1400129	457
407	Ternary doping of phosphorus, nitrogen, and sulfur into porous carbon for enhancing electrocatalytic oxygen reduction. **2015**, 92, 327-338	125
406	Tuning laccase catalytic activity with phosphate functionalized carbon dots by visible light. **2015**, 7, 10004-12	79
405	Ag-Cu nanoalloyed film as a high-performance cathode electrocatalytic material for zinc-air battery. **2015**, 10, 197	20
404	Metal-free catalysts for oxygen reduction reaction. **2015**, 115, 4823-92	1763
403	Magnesiothermic synthesis of sulfur-doped graphene as an efficient metal-free electrocatalyst for oxygen reduction. **2015**, 5, 9304	85
402	Nitrogen doped carbon nanotubes with encapsulated ferric carbide as excellent electrocatalyst for oxygen reduction reaction in acid and alkaline media. **2015**, 286, 495-503	101
401	Structure-activity relationship in high-performance iron-based electrocatalysts for oxygen reduction reaction. **2015**, 300, 279-284	56
400	Facile and scalable synthesis of coal tar-derived, nitrogen and sulfur-codoped carbon nanotubes with superior activity for O2 reduction by employing an evocating agent. **2015**, 3, 22723-22729	14
399	Electrocatalytic and supercapacitor performance of Phosphorous and Nitrogen co-doped Porous Carbons synthesized from Aminated Tannins. **2015**, 182, 987-994	30
398	□ber die Rolle von Metallen in Elektrokatalysatoren auf Basis von stickstoffdotiertem Kohlenstoff f□ die Sauerstoffreduktion. **2015**, 127, 10240-10259	69

397	Significant Contribution of Intrinsic Carbon Defects to Oxygen Reduction Activity. **2015**, 5, 6707-6712	400
396	Transformation of worst weed into N-, S-, and P-tridoped carbon nanorings as metal-free electrocatalysts for the oxygen reduction reaction. **2015**, 3, 23376-23384	42
395	Carbon-based electrocatalysts for advanced energy conversion and storage. **2015**, 1, e1500564	434
394	Porous nitrogen doped carbon foam with excellent resilience for self-supported oxygen reduction catalyst. **2015**, 95, 388-395	65
393	Hydrochlorination of acetylene using supported phosphorus-doped Cu-based catalysts. **2015**, 5, 5174-5184	41
392	Nanostructured SnS-N-doped graphene as an advanced electrocatalyst for the hydrogen evolution reaction. **2015**, 51, 15716-9	65
391	Metal-free, carbon-based catalysts for oxygen reduction reactions. **2015**, 9, 280-294	15
390	Iodine/nitrogen co-doped graphene as metal free catalyst for oxygen reduction reaction. **2015**, 95, 930-939	87
389	Iron–nitrogen co-doped hollow carbon sphere with mesoporous structure for enhanced oxygen reduction reaction. **2015**, 5, 103302-103307	13
388	Novel tannin-based Si, P co-doped carbon for supercapacitor applications. **2015**, 275, 835-844	39
387	Low Pt content catalyst supported on nitrogen and phosphorus-codoped carbon nanotubes for electrocatalytic O2 reaction in acidic medium. **2015**, 142, 115-118	12
386	Enhanced catalytic activity for the oxygen reduction reaction with co-doping of phosphorus and iron in carbon. **2015**, 277, 161-168	38
385	Transforming chitosan into N-doped graphitic carbon electrocatalysts. **2015**, 51, 1334-7	105
384	Bismuth oxide nanoparticles as a nanoscale guide to form a silver–polydopamine hybrid electrocatalyst with enhanced activity and stability for the oxygen reduction reaction. **2015**, 5, 4286-4291	6
383	Synthesis of phosphorus-doped carbon hollow spheres as efficient metal-free electrocatalysts for oxygen reduction. **2015**, 82, 562-571	194
382	Bacterial cellulose derived nitrogen-doped carbon nanofiber aerogel: An efficient metal-free oxygen reduction electrocatalyst for zinc-air battery. **2015**, 11, 366-376	333
381	High-performance lithium iron phosphate with phosphorus-doped carbon layers for lithium ion batteries. **2015**, 3, 2043-2049	68
380	High activity electrocatalysts from metal–organic framework-carbon nanotube templates for the oxygen reduction reaction. **2015**, 82, 417-424	121

379	Fe-containing polyimide-based high-performance ORR catalysts in acidic medium: a kinetic approach to study the durability of catalysts. **2015**, 5, 475-483	69
378	Influence of configuration at dopant sites on catalytic activity of phosphorus-doped graphite. **2015**, 81, 260-271	22
377	Layered SiC sheets: a potential catalyst for oxygen reduction reaction. **2014**, 4, 3821	92
376	Heteroatoms ternary-doped porous carbons derived from MOFs as metal-free electrocatalysts for oxygen reduction reaction. **2014**, 4, 5130	155
375	Accurate Assessment of the Oxygen Reduction Electrocatalytic Activity of Mn/Polypyrrole Nanocomposites Based on Rotating Disk Electrode Measurements, Complemented with Multitechnique Structural Characterizations. **2016**, 2016, 2030675	3
374	Recent Progress on MOF-Derived Nanomaterials as Advanced Electrocatalysts in Fuel Cells. **2016**, 6, 116	84
373	Sulfur-Enriched Conjugated Polymer Nanosheet Derived Sulfur and Nitrogen co-Doped Porous Carbon Nanosheets as Electrocatalysts for Oxygen Reduction Reaction and Zinc–Air Battery. **2016**, 26, 5893-5902	189
372	Effect of N-doped carbon quantum dots/multiwall-carbon nanotube composite support on Pt catalytic performance for methanol electrooxidation. **2016**, 6, 67096-67101	7
371	Activity and Stability of Ruddlesden-Popper-Type La(n+1) Ni(n) O(3n+1) (n=1, 2, 3, and ∞) Electrocatalysts for Oxygen Reduction and Evolution Reactions in Alkaline Media. **2016**, 22, 2719-27	80
370	Phosphorous–Nitrogen-Codoped Carbon Materials Derived from Metal–Organic Frameworks as Efficient Electrocatalysts for Oxygen Reduction Reactions. **2016**, 2016, 2100-2105	57
369	Significant Enhancement of Water Splitting Activity of N-Carbon Electrocatalyst by Trace Level Co Doping. **2016**, 12, 3703-11	93
368	A sulfur doped carbon nanotube as a potential catalyst for the oxygen reduction reaction. **2016**, 6, 63084-63090	108
367	Nitrogen, Phosphorus, and Sulfur Co-Doped Hollow Carbon Shell as Superior Metal-Free Catalyst for Selective Oxidation of Aromatic Alkanes. *Angewandte Chemie - International Edition*, **2016**, 55, 4016-20	16.4 211
366	Nitrogen, Phosphorus, and Sulfur Co-Doped Hollow Carbon Shell as Superior Metal-Free Catalyst for Selective Oxidation of Aromatic Alkanes. **2016**, 128, 4084-4088	50
365	Non-precious Metal Oxide and Metal-free Catalysts for Energy Storage and Conversion. **2016**, 243-320	
364	Facile synthesis of nitrogen and sulfur dual-doped graphitized carbon microspheres and their high performance in the oxygen reduction reaction. **2016**, 6, 38880-38886	3
363	Catalysis with two-dimensional materials and their heterostructures. **2016**, 11, 218-30	1433
362	Progress in the Development of Oxygen Reduction Reaction Catalysts for Low-Temperature Fuel Cells. **2016**, 7, 509-32	41

361	Creation of Ge-Nx-Cy Configures in Carbon Nanotubes: Origin of Enhanced Electrocatalytic Performance for Oxygen Reduction Reaction. **2016**, 8, 10383-91	18
360	Germanium and phosphorus co-doped carbon nanotubes with high electrocatalytic activity for oxygen reduction reaction. **2016**, 6, 33205-33211	14
359	Theoretical insights on the reaction pathways for oxygen reduction reaction on phosphorus doped graphene. **2016**, 105, 214-223	48
358	N, S and P-ternary doped carbon nano-pore/tube composites derived from natural chemicals in waste sweet osmanthus fruit with superior activity for oxygen reduction in acidic and alkaline media. **2016**, 6, 37500-37505	20
357	Natural tea-leaf-derived, ternary-doped 3D porous carbon as a high-performance electrocatalyst for the oxygen reduction reaction. **2016**, 9, 1244-1255	48
356	Doping sp2 carbon to boost the activity for oxygen reduction in an acidic medium: a theoretical exploration. **2016**, 6, 48498-48503	11
355	Metal-Free and Noble Metal-Free Heteroatom-Doped Nanostructured Carbons as Prospective Sustainable Electrocatalysts. **2016**, 49, 1873-83	158
354	Theoretical Investigation on the Reaction Pathways of the Oxygen Reduction Reaction on Graphene Codoped with Manganese and Phosphorus as a Potential Nonprecious Metal Catalyst. **2016**, 8, 3353-3360	6
353	Kohlenstoffbasierte Metallfreie Katalysatoren f□ die Elektrokatalyse jenseits der ORR. **2016**, 128, 11910-11933	47
352	Nitrogen-doped mesoporous hollow carbon nanoflowers as high performance anode materials of lithium ion batteries. **2016**, 6, 93519-93524	9
351	Honeycomb-like hierarchical carbon derived from livestock sewage sludge as oxygen reduction reaction catalysts in microbial fuel cells. **2016**, 41, 22328-22336	29
350	3D graphene-based hybrid materials: synthesis and applications in energy storage and conversion. **2016**, 8, 15414-47	105
349	Heteroatom-Doped Nanostructured Carbon Materials. **2016**, 219-235	
348	Spherical Core□Shell Titanium (Oxy)nitride@Nitrided Carbon Composites as Catalysts for the Oxygen Reduction Reaction: Synthesis and Electrocatalytic Performance. **2016**, 3, 1641-1654	9
347	Recent Progress in Synthesis, Characterization and Evaluation of Non-Precious Metal Catalysts for the Oxygen Reduction Reaction. **2016**, 16, 4-22	93
346	Hydrothermal synthesis of porous phosphorus-doped carbon nanotubes and their use in the oxygen reduction reaction and lithium-sulfur batteries. **2016**, 31, 352-362	71
345	Nitrogen Doping in Oxygen-Deficient CaFeO: A Strategy for Efficient Oxygen Reduction Oxide Catalysts. **2016**, 8, 34387-34395	37
344	Stimulation of electrocatalytic oxygen reduction activity on nitrogen doped graphene through noncovalent molecular functionalisation. **2016**, 52, 10385-8	13

343	Carbon-Based Metal-Free Catalysts for Electrocatalysis beyond the ORR. *Angewandte Chemie - International Edition*, **2016**, 55, 11736-58	16.4	458
342	Nitrogen-doped amorphous carbon with effective electrocatalytic activity toward oxygen reduction reaction. **2016**, 84, 118-123		11
341	N-Doped carbon decorated with molybdenum disulfide with excellent electrochemical performance for lithium-ion batteries. **2016**, 6, 75626-75631		5
340	Identifying the Catalytic Active Sites in Heteroatom-Doped Graphene for the Oxygen Reduction Reaction. **2016**, 16, 568-576		10
339	Non-Pt Nanostructured Catalysts for Oxygen Reduction Reaction: Synthesis, Catalytic Activity and its Key Factors. **2016**, 6, 1600458		125
338	Germanium-doped and germanium/nitrogen-codoped carbon nanotubes with highly enhanced activity for oxygen reduction in alkaline medium. **2016**, 6, 72676-72680		5
337	Honey-Based P, N and Si Tri-Doped Graphitic Carbon Electrocatalysts for Oxygen Reduction Reaction in Alkaline Conditions. **2016**, 1, 3527-3534		3
336	Microwave Exfoliation of Graphite Oxides in HS Plasma for the Synthesis of Sulfur-Doped Graphenes as Oxygen Reduction Catalysts. **2016**, 8, 31849-31855		26
335	Graphitic Carbon Nitride as a Catalyst Support in Fuel Cells and Electrolyzers. **2016**, 222, 44-57		83
334	Theoretical Investigation on the Reaction Pathways for Oxygen Reduction Reaction on Silicon Doped Graphene as Potential Metal-Free Catalyst. **2016**, 163, F1496-F1502		17
333	Carbon-based metal-free catalysts. **2016**, 1,		777
332	Nanoscale Electrocatalysis of Hydrazine Electro-Oxidation at Blistered Graphite Electrodes. **2016**, 8, 30458-30466		30
331	Nitrogen, phosphorus and sulfur co-doped ultrathin carbon nanosheets as a metal-free catalyst for selective oxidation of aromatic alkanes and the oxygen reduction reaction. **2016**, 4, 18470-18477		80
330	Ionic-Liquid-Derived Boron-Doped Cobalt-Coordinating Nitrogen-Doped Carbon Materials for Enhanced Catalytic Activity. **2016**, 8, 1782-1787		12
329	Electrocatalytic performances of phosphorus doped carbon supported Pd towards formic acid oxidation. **2016**, 213, 21-30		27
328	Synthesis and extensive characterisation of phosphorus doped graphite. **2016**, 6, 62140-62145		4
327	Shrimp-shell derived carbon nanodots as carbon and nitrogen sources to fabricate three-dimensional N-doped porous carbon electrocatalysts for the oxygen reduction reaction. **2016**, 18, 4095-101		79
326	Doping Effects in the Charge Transport of Graphene-Porphyrins. **2016**, 120, 2013-2026		10

325	P-Doped Porous Carbon as Metal Free Catalysts for Selective Aerobic Oxidation with an Unexpected Mechanism. **2016**, 10, 2305-15	195
324	Three-dimensional (3D) interconnected networks fabricated via in-situ growth of N-doped graphene/carbon nanotubes on Co-containing carbon nanofibers for enhanced oxygen reduction. **2016**, 9, 317-328	65
323	Nitrogen-Doped Carbon Nanotubes Supported by Macroporous Carbon as an Efficient Enzymatic Biosensing Platform for Glucose. **2016**, 88, 1371-7	70
322	Doping effect of boron and phosphorus on nitrogen-based mesoporous carbons as electrocatalysts for oxygen reduction reaction in acid media. **2016**, 20, 645-655	13
321	Nanosizing low-loading Pd on phosphorus-doped carbon nanotubes for enhanced HCOOH oxidation performance. **2016**, 67, 26-30	17
320	Ionic liquid-assisted synthesis of dual-doped graphene as efficient electrocatalysts for oxygen reduction. **2016**, 102, 58-65	45
319	Chemically drilling carbon nanotubes for electrocatalytic oxygen reduction reaction. **2016**, 190, 49-56	25
318	Novel As-doped, As and N-codoped carbon nanotubes as highly active and durable electrocatalysts for O2 reduction in alkaline medium. **2016**, 306, 535-540	17
317	Ozone-Mediated Functionalization of Multi-Walled Carbon Nanotubes and Their Activities for Oxygen Reduction Reaction. **2016**, 32, 533-538	16
316	Thiophene adsorption on phosphorus- and nitrogen-doped graphites: Control of desulfurization properties of carbon materials by heteroatom doping. **2016**, 98, 115-125	30
315	Nitrogen-doped carbons prepared from eutectic mixtures as metal-free oxygen reduction catalysts. **2016**, 4, 478-488	32
314	Prussian blue as a single precursor for synthesis of Fe/Fe3C encapsulated N-doped graphitic nanostructures as bi-functional catalysts. **2016**, 18, 427-432	125
313	Efficient Synthesis of Nitrogen- and Sulfur-co-Doped Ketjenblack with a Single-Source Precursor for Enhancing Oxygen Reduction Reaction Activity. **2017**, 23, 3674-3682	19
312	Heteroatoms doped graphene for catalytic ozonation of sulfamethoxazole by metal-free catalysis: Performances and mechanisms. **2017**, 317, 632-639	79
311	Fe/N co-doped mesoporous carbon nanomaterial as an efficient electrocatalyst for oxygen reduction reaction. **2017**, 231, 549-556	41
310	Metal organic frameworks as precursors for the manufacture of advanced catalytic materials. **2017**, 1, 1709-1745	174
309	Two in one: N-doped tubular carbon nanostructure as an efficient metal-free dual electrocatalyst for hydrogen evolution and oxygen reduction reactions. **2017**, 5, 6025-6031	55
308	Hollow-structured conjugated porous polymer derived Iron/Nitrogen-codoped hierarchical porous carbons as highly efficient electrocatalysts. **2017**, 497, 108-116	23

307	Graphene-Based Phosphorus-Doped Carbon as Anode Material for High-Performance Sodium-Ion Batteries. **2017**, 34, 1600315	23
306	Progress of air-breathing cathode in microbial fuel cells. **2017**, 356, 245-255	91
305	N-Doped Graphene from Metal□Organic Frameworks for Catalytic Oxidation of p-Hydroxylbenzoic Acid: N-Functionality and Mechanism. **2017**, 5, 2693-2701	152
304	Heteroatom-Doped Carbon Materials for Electrocatalysis. **2017**, 23, 10703-10713	44
303	Electrochemical synthesis of phosphorus-doped graphene quantum dots for free radical scavenging. **2017**, 19, 11631-11638	110
302	Heteroatom-doped Nanostructured Carbon Materials asORR Electrocatalysts for Low-temperature Fuel Cells. **2017**, 401-421	2
301	A mesoporous tin phosphate-graphene oxide hybrid toward the oxygen reduction reaction. **2017**, 53, 5721-5724	17
300	Carbon-based catalysts for metal-free electrocatalysis. **2017**, 4, 18-25	70
299	Polyoxometalate-Functionalized Nanocarbon Materials for Energy Conversion, Energy Storage, and Sensor Systems. **2017**, 69, 181-212	14
298	A bottom-up, template-free route to mesoporous N-doped carbons for efficient oxygen electroreduction. **2017**, 52, 9794-9805	7
297	Lettuce□like, Hierarchically Porous and Nitrogen-Doped Carbon Catalyst: As a Superb non-Precious-Metal Oxygen Reduction Reaction Electrocatalyst in both Alkaline and Acidic Media. **2017**, 2, 4176-4186	
296	In situ, facile synthesis of La0.8Sr0.2MnO3/nitrogen-doped graphene: a high-performance catalyst for rechargeable Li-O2 batteries. **2017**, 23, 2241-2250	9
295	Opening Two-Dimensional Materials for Energy Conversion and Storage: A Concept. **2017**, 7, 1602684	206
294	Fe/N/S-composited hierarchically porous carbons with optimized surface functionality, composition and nanoarchitecture as electrocatalysts for oxygen reduction reaction. **2017**, 352, 208-217	33
293	Coating procedure for chemical and morphological functionalization of multilayer-graphene foams. **2017**, 121, 170-180	2
292	MOF-templated nitrogen-doped porous carbon materials as efficient electrocatalysts for oxygen reduction reactions. **2017**, 4, 1231-1237	12
291	Active sites on graphene-based materials as metal-free catalysts. **2017**, 46, 4501-4529	205
290	From melamine sponge towards 3D sulfur-doping carbon nitride as metal-free electrocatalysts for oxygen reduction reaction. **2017**, 4, 076305	4

289	Electrocatalytic Activity and Design Principles of Heteroatom-Doped Graphene Catalysts for Oxygen-Reduction Reaction. **2017**, 121, 14434-14442	41
288	Two-dimensional nanosheets for electrocatalysis in energy generation and conversion. **2017**, 5, 7257-7284	186
287	Recent Advances in Ultrathin Two-Dimensional Nanomaterials. **2017**, 117, 6225-6331	2919
286	Uniform nitrogen and sulphur co-doped hollow carbon nanospheres as efficient metal-free electrocatalysts for oxygen reduction. **2017**, 5, 1742-1748	44
285	Highly active and stable single iron site confined in graphene nanosheets for oxygen reduction reaction. **2017**, 32, 353-358	194
284	Scalable 3-D Carbon Nitride Sponge as an Efficient Metal-Free Bifunctional Oxygen Electrocatalyst for Rechargeable Zn-Air Batteries. **2017**, 11, 347-357	306
283	Iron phosphide/N, P-doped carbon nanosheets as highly efficient electrocatalysts for oxygen reduction reaction over the whole pH range. **2017**, 254, 280-286	40
282	Rupturing Cotton Microfibers into Mesoporous Nitrogen-Doped Carbon Nanosheets as Metal-Free Catalysts for Efficient Oxygen Electroreduction. **2017**, 5, 9709-9717	19
281	Porphyrinic coordination lattices with fluoropillars. **2017**, 5, 21189-21195	13
280	Highly N-doped microporous carbon nanospheres with high energy storage and conversion efficiency. **2017**, 7, 14400	18
279	Eco-friendly fabricated nonporous carbon nanofibers with high volumetric capacitance: improving rate performance by tri-dopants of nitrogen, phosphorus, and silicon. **2017**, 4, 2024-2032	18
278	Easy synthesis of N-doped graphene by milling exfoliation with electrocatalytic activity towards the Oxygen Reduction Reaction (ORR). **2017**, 42, 30383-30388	17
277	A study of defect-rich carbon spheres as a metal-free electrocatalyst for an efficient oxygen reduction reaction. **2017**, 5, 24314-24320	28
276	Theoretical insights on the reaction pathways of the oxygen reduction reaction on yttrium doped graphene as a catalyst in fuel cells. **2017**, 232, 131-137	1
275	Adsorptive recovery of neodymium and dysprosium in phosphorous functionalized nanoporous carbon. **2017**, 5, 4684-4692	16
274	Robust Catalysis on 2D Materials Encapsulating Metals: Concept, Application, and Perspective. **2017**, 29, 1606967	240
273	Phosphorus-Doped and Lattice-Defective Carbon as Metal-like Catalyst for the Selective Hydrogenation of Nitroarenes. **2017**, 9, 4287-4294	38
272	Facile and scalable preparation of nitrogen, phosphorus codoped nanoporous carbon as oxygen reduction reaction electrocatalyst. **2017**, 248, 11-19	22

271	Electrocatalysts Derived from Metal-Organic Frameworks for Oxygen Reduction and Evolution Reactions in Aqueous Media. **2017**, 13, 1701143	125
270	Predicting the suitability of aqueous solutions of deep eutectic solvents for preparation of co-continuous porous carbons via spinodal decomposition processes. **2017**, 123, 536-547	27
269	Influence of Phosphorus Configuration on Electronic Structure and Oxygen Reduction Reactions of Phosphorus-Doped Graphene. **2017**, 121, 19321-19328	55
268	Highly Porous Nitrogen- and Phosphorus-Codoped Graphene: An Outstanding Support for Pd Catalysts to Oxidize 5-Hydroxymethylfurfural into 2,5-Furandicarboxylic Acid. **2017**, 5, 11300-11306	47
267	Biomass-derived heteroatoms-doped mesoporous carbon for efficient oxygen reduction in microbial fuel cells. **2017**, 98, 350-356	75
266	Phosphorus-doped helical carbon nanofibers as enhanced sensing platform for electrochemical detection of carbendazim. **2017**, 221, 457-463	54
265	Mesoporous Carbon Materials with Functional Compositions. **2017**, 23, 1986-1998	44
264	Advancing Lithium□Oxygen Battery Technology with an Iron□Nitrogen-Doped Mesoporous Core□Shell Carbon Cathode Loaded with Ruthenium(IV) Oxide Nanoparticles. **2017**, 5, 732-739	5
263	Oxygen-Molecule Adsorption and Dissociation on BCN Graphene: A First-Principles Study. **2017**, 18, 101-110	10
262	Significance of optimal N-doping in mesoporous carbon framework to achieve high specific capacitance. **2017**, 418, 40-48	31
261	Metal-Free Carbon-Based Materials: Promising Electrocatalysts for Oxygen Reduction Reaction in Microbial Fuel Cells. **2016**, 18,	49
260	Synthesis of phosphorus doped carbon nanotubes using chemical vapor deposition. **2018**, 26, 218-225	19
259	Metal-Free Oxygen Evolution and Oxygen Reduction Reaction Bifunctional Electrocatalyst in Alkaline Media: From Mechanisms to Structure□Catalytic Activity Relationship. **2018**, 6, 4973-4980	46
258	A density functional theory study of the role of functionalized graphene particles as effective additives in power cable insulation. **2018**, 5, 170772	7
257	Phosphorus-doped carbon nanoparticles supported palladium electrocatalyst for the hydrogen evolution reaction (HER) in PEM water electrolysis. **2018**, 24, 3113-3121	17
256	Holey Co, N-codoped graphene aerogel with in-plane pores and multiple active sites for efficient oxygen reduction. **2018**, 269, 544-552	21
255	Flexible phosphorus doped carbon nanosheets/nanofibers: Electrospun preparation and enhanced Li-storage properties as free-standing anodes for lithium ion batteries. **2018**, 384, 27-33	36
254	Non-platinum metal-organic framework based electro-catalyst for promoting oxygen reduction reaction. **2018**,	1

253	Application of graphene-based materials in water purification: from the nanoscale to specific devices. **2018**, 5, 1264-1297	73
252	Refining cocoon to prepare (N, S, and Fe) ternary-doped porous carbon aerogel as efficient catalyst for the oxygen reduction reaction in alkaline medium. **2018**, 384, 48-57	47
251	Carbon catalysts for electrochemical hydrogen peroxide production in acidic media. **2018**, 272, 192-202	41
250	Achieving commercial-level mass loading in ternary-doped holey graphene hydrogel electrodes for ultrahigh energy density supercapacitors. **2018**, 46, 266-276	110
249	Recent developments in electrocatalysts and future prospects for oxygen reduction reaction in polymer electrolyte membrane fuel cells. **2018**, 27, 1124-1139	68
248	Two-Dimensional Phosphorus-Doped Carbon Nanosheets with Tunable Porosity for Oxygen Reactions in Zinc-Air Batteries. **2018**, 8, 2464-2472	129
247	Carbon skeleton doped with Co, N, S and P as efficient electrocatalyst for oxygen evolution reaction. **2018**, 61, 686-696	8
246	Phosphorus-assisted solid-phase approach to three-dimensional highly porous graphene sheets and their capacitance properties. **2018**, 132, 8-15	11
245	Metal-free electrocatalysis: Quaternary-doped graphene and the alkaline oxygen reduction reaction. **2018**, 553, 107-116	33
244	Boron-nitrogen-phosphorous doped graphene nanoplatelets for enhanced electrocatalytic activity. **2018**, 99, 511-517	14
243	Nitrogen/phosphorus dual-doped hierarchically porous graphitic biocarbon with greatly improved performance on oxygen reduction reaction in alkaline media. **2018**, 809, 163-170	16
242	N, P Co-doped Hierarchical Porous Graphene as a Metal-Free Bifunctional Air Cathode for Zn-Air Batteries. **2018**, 5, 1811-1816	15
241	Size effect of oxygen reduction reaction on nitrogen-doped graphene quantum dots. **2018**, 8, 531-536	23
240	Ternary doped porous carbon nanofibers with excellent ORR and OER performance for zinc-air batteries. **2018**, 6, 10918-10925	150
239	Highly flexible pseudocapacitors of phosphorus-incorporated porous reduced graphene oxide films. **2018**, 390, 93-99	28
238	B, N Codoped and Defect-Rich Nanocarbon Material as a Metal-Free Bifunctional Electrocatalyst for Oxygen Reduction and Evolution Reactions. **2018**, 5, 1800036	126
237	Compositing doped-carbon with metals, non-metals, metal oxides, metal nitrides and other materials to form bifunctional electrocatalysts to enhance metal-air battery oxygen reduction and evolution reactions. **2018**, 348, 416-437	100
236	Highly dispersed Co nanoparticles inlayed in S, N-doped hierarchical carbon nanoprisms derived from Co-MOFs as efficient electrocatalysts for oxygen reduction reaction. **2018**, 318, 126-131	22

235	Rational Design and Synthesis of Low-Temperature Fuel Cell Electrocatalysts. **2018**, 1, 54-83	72
234	Incorporation of Fe3C and Pyridinic N Active Sites with a Moderate N/C Ratio in Fe□N Mesoporous Carbon Materials for Enhanced Oxygen Reduction Reaction Activity. **2018**, 1, 1801-1810	35
233	Efficient N-doping of hollow core-mesoporous shelled carbon spheres via hydrothermal treatment in ammonia solution for the electrocatalytic oxygen reduction reaction. **2018**, 261, 88-97	57
232	Advanced catalysts for sustainable hydrogen generation and storage via hydrogen evolution and carbon dioxide/nitrogen reduction reactions. **2018**, 92, 64-111	161
231	A kinetics study on cumene oxidation catalyzed by carbon nanotubes: Effect of N-doping. **2018**, 177, 391-398	24
230	A nitrogen-doped electrocatalyst from metal-organic framework-carbon nanotube composite. **2018**, 33, 538-545	13
229	Electrocatalysis of oxygen reduction on heteroatom-doped nanocarbons and transition metal□nitrogen□carbon catalysts for alkaline membrane fuel cells. **2018**, 6, 776-804	257
228	Nest-like assembly of the doped single-walled carbon nanotubes with unique mesopores as ultrastable catalysts for high power density Zn-air battery. **2018**, 128, 46-53	14
227	Oxygen Reduction Catalysts on Nanoparticle Electrodes. **2018**, 796-811	2
226	Molybdenum carbide promotion on Fe-N-doped carbon nanolayers facilely prepared for enhanced oxygen reduction. **2018**, 10, 21944-21950	9
225	Constructing Successive Active Sites for Metal-free Electrocatalyst with Boosted Electrocatalytic Activities Toward Hydrogen Evolution and Oxygen Reduction Reactions. **2018**, 10, 5194-5200	22
224	Phosphate-Based Electrocatalysts for Water Splitting: Recent Progress. **2018**, 5, 3822-3834	63
223	Characterization of Electronic, Electrical, Optical, and Mechanical Properties of Graphene. **2018**, 805-822	1
222	Nitrogen and Sulfur Dual Self-Doped Graphitic Carbon with Highly Catalytic Activity for Oxygen Reduction Reaction. **2018**,	4
221	Origin of the catalytic activity of phosphorus doped MoS for oxygen reduction reaction (ORR) in alkaline solution: a theoretical study. **2018**, 8, 13292	13
220	Nickel Nanoparticles Encapsulated in Nitrogen-Doped Carbon Nanotubes as Excellent Bifunctional Oxygen Electrode for Fuel Cell and Metal□Air Battery. **2018**, 6, 15108-15118	35
219	Promise and Challenge of Phosphorus in Science, Technology, and Application. **2018**, 28, 1803471	49
218	Design Principles for Heteroatom-Doped Carbon Materials as Metal-Free Catalysts. **2018**, 1-33	1

217	Hydrothermal Carbon Materials for the Oxygen Reduction Reaction. **2018**, 369-401		2
216	Functionalized Graphene-Based, Metal-Free Electrocatalysts for Oxygen Reduction Reaction in Fuel Cells. **2018**, 529-554		1
215	Carbon-Based, Metal-Free Catalysts for Chemical Catalysis. **2018**, 597-657		2
214	Synthesis of Carbon-Nitrogen-Phosphorous Materials with an Unprecedented High Amount of Phosphorous toward an Efficient Fire-Retardant Material. *Angewandte Chemie - International Edition*, **2018**, 57, 9764-9769	16.4	21
213	Synthesis of Carbon□Nitrogen□Phosphorous Materials with an Unprecedented High Amount of Phosphorous toward an Efficient Fire-Retardant Material. **2018**, 130, 9912-9917		1
212	Nitrogen-doped carbon layer coated CeNiOx as electrocatalyst for oxygen reduction reaction. **2018**, 761, 8-14		8
211	Heteroatom (B, N and P) doped porous graphene foams for efficient oxygen reduction reaction electrocatalysis. **2018**, 43, 12661-12670		41
210	Boron and nitrogen co-doped graphene aerogels: Facile preparation, tunable doping contents and bifunctional oxygen electrocatalysis. **2018**, 137, 458-466		59
209	Negatively charged boron nitride nanosheets as a potential metal-free electrocatalyst for the oxygen reduction reaction: a computational study. **2018**, 42, 12838-12844		9
208	Novel Nanomaterials as Electrocatalysts for Fuel Cells. **2018**, 169-204		2
207	Phosphorus-doped graphene-based electrochemical sensor for sensitive detection of acetaminophen. **2018**, 1036, 26-32		59
206	Application of Nanomaterials Prepared by Thermolysis of Metal Chelates. **2018**, 459-541		
205	Bulk Phosphorus-Doped Graphitic Carbon. **2018**, 30, 4580-4589		10
204	P-Doped Three-Dimensional Porous Carbon Networks as Efficient Metal-Free Electrocatalysts for ORR. **2018**, 7, M123-M127		5
203	N, P, S co-doped hollow carbon polyhedra derived from MOF-based core□shell nanocomposites for capacitive deionization. **2018**, 6, 15245-15252		185
202	Sulfur, nitrogen co-doped nanocomposite of graphene and carbon nanotube as an efficient bifunctional electrocatalyst for oxygen reduction and evolution reactions. **2018**, 93, 336-341		8
201	Using Multifunctional Polymeric Soft Template for Synthesizing Nitrogen and Phosphorus Co□Doped Mesoporous Carbon Frameworks Electrocatalysts for Oxygen Reduction Reaction. **2018**, 3, 9013-9020		2
200	The progress of metal-free catalysts for the oxygen reduction reaction based on theoretical simulations. **2018**, 6, 13489-13508		59

199	Carbon nanotube encapsulated in nitrogen and phosphorus co-doped carbon as a bifunctional electrocatalyst for oxygen reduction and evolution reactions. **2018**, 139, 156-163	77
198	Biomass-derived phosphorus-doped carbon materials as efficient metal-free catalysts for selective aerobic oxidation of alcohols. **2019**, 21, 5274-5283	30
197	Fe, N co-doped carbonaceous hollow spheres with self-grown carbon nanotubes as a high performance binary electrocatalyst. **2019**, 154, 466-477	28
196	P-doped mesoporous carbons for high-efficiency electrocatalytic oxygen reduction. **2019**, 40, 1366-1374	25
195	Graphitic carbon nitride nanostructures: Catalysis. **2019**, 16, 388-424	35
194	Enhancement mechanism of sulfur dopants on the catalytic activity of N and P co-doped three-dimensional hierarchically porous carbon as a metal-free oxygen reduction electrocatalyst. **2019**, 9, 5906-5914	13
193	A review of oxygen reduction mechanisms for metal-free carbon-based electrocatalysts. **2019**, 5,	257
192	Defect-enriched tunability of electronic and charge-carrier transport characteristics of 2D borocarbonitride (BCN) monolayers from ab initio calculations. **2019**, 11, 19398-19407	11
191	Metal-Free N, P-Codoped Porous Carbon Fibers for Oxygen Reduction Reactions. **2019**, 166, H549-H555	6
190	Carbon fragments as highly active metal-free catalysts for the oxygen reduction reaction: a mechanistic study. **2019**, 11, 19422-19428	11
189	ZIF-8 derived nitrogen, phosphorus and sulfur tri-doped mesoporous carbon for boosting electrocatalysis to oxygen reduction in universal pH range. **2019**, 318, 783-793	16
188	Effect of oxidizing treatment on electrocatalytic activity of boron-doped amorphous carbon thin films. **2019**, 29, 487-495	2
187	Tuning Nitrogen Species in Two-Dimensional Carbon through Pore Structure Change for High Supercapacitor Performance. **2019**, 6, 5220-5228	4
186	Fe/Fe3C Nanoparticles Confined in Graphitic Layers/Carbon Nanotubes as Efficient Oxygen Reduction Reaction Catalysts. **2019**, 4, 10863-10867	2
185	Waste wine mash-derived doped carbon materials as an efficient electrocatalyst for oxygen reduction reaction. **2019**, 44, 31949-31959	12
184	Controlling the Electromagnetic and Electrochemical Sensing Properties of Graphene via Heteroatom Doping. **2019**, 663-682	2
183	Electronic and Physical Property Manipulations: Recent Achievements towards Heterogeneous Carbon-based Catalysts for Oxygen Reduction Reaction. **2019**, 11, 5885-5897	14
182	Sulphur and nitrogen co-doped graphene-based electrocatalysts for oxygen reduction reaction in alkaline medium. **2019**, 109, 106603	25

181	Chirality Induces the Self-Assembly To Generate a 3D Porous Spiral-like Polyhedron as Metal-Free Electrocatalysts for the Oxygen Reduction Reaction. **2019**, 11, 45596-45605	8
180	Electrochemical Exfoliation of Graphite to Fluorographene: An Effect of Degree of Functionalization on 2Br/Br2 Redox Reaction. **2019**, 4, 11385-11393	2
179	Shaddock peel derived nitrogen and phosphorus dual-doped hierarchical porous carbons as high-performance catalysts for oxygen reduction reaction. **2019**, 44, 26982-26991	12
178	Graphite N-C-P dominated three-dimensional nitrogen and phosphorus co-doped holey graphene foams as high-efficiency electrocatalysts for Zn-air batteries. **2019**, 11, 17010-17017	29
177	Operando Insight into the Oxygen Evolution Kinetics on the Metal-Free Carbon-Based Electrocatalyst in an Acidic Solution. **2019**, 11, 34854-34861	20
176	Electron-Rich Ruthenium on Nitrogen-Doped Carbons Promoting Levulinic Acid Hydrogenation to Valerolactone: Effect of MetalSupport Interaction. **2019**, 7, 16501-16510	32
175	Design and theoretical study of carbon-based supercapacitors especially exhibiting superior rate capability by the synergistic effect of nitrogen and phosphor dopants. **2019**, 155, 223-232	25
174	Metalrganic frameworks-based catalysts for electrochemical oxygen evolution. **2019**, 6, 684-702	104
173	Using lithium chloride as a medium to prepare N,P-codoped carbon nanosheets for oxygen reduction and evolution reactions. **2019**, 6, 417-422	2
172	Engineering Two-Dimensional Materials and Their Heterostructures as High-Performance Electrocatalysts. **2019**, 2, 373-394	47
171	Carbon nanotube@ZIFerived Fe-N-doped carbon electrocatalysts for oxygen reduction and evolution reactions. **2019**, 23, 2225-2232	5
170	Role of P-doping in Antipoisoning: Efficient MOF-Derived 3D Hierarchical Architectures for the Oxygen Reduction Reaction. **2019**, 123, 16796-16803	34
169	Two dimensional graphene oxides converted to three dimensional P, N, F and B, N, F tri-doped graphene by ionic liquid for efficient catalytic performance. **2019**, 151, 53-67	35
168	Selective Activation of S or N-Containing Carbon Segments by Alkalic or Acidic Activators. **2019**, 58, 9048-9055	1
167	Selenium-Coupled Reduced Graphene Oxide as Single-Atom Site Catalyst for Direct Four-Electron Oxygen Reduction Reaction. **2019**, 2, 3624-3632	11
166	Facile Synthesis of Cobalt and Nitrogen Coordinated Carbon Nanotube as a High-Performance Electrocatalyst for Oxygen Reduction Reaction in Both Acidic and Alkaline Media. **2019**, 7, 10951-10961	12
165	Metal-free electrocatalysts for oxygen reduction reaction based on trioxotriangulene. **2019**, 2,	29
164	Oxygen vacancy enhanced photoelectrochemical performance of BiMoO/B, N co-doped graphene for fabricating lincomycin aptasensor. **2019**, 135, 145-152	29

163	Oxygen reduction reaction performance of Fe-N/C catalysts from ligand-iron coordinative supramolecular precursors. **2019**, 30, 305402	7
162	Role of Graphene Edges in the Electron Transfer Kinetics: Insight from Theory and Molecular Modeling. **2019**, 123, 6627-6634	14
161	Doped Graphene for Electrochemical Energy Storage Systems. **2019**, 511-612	1
160	Recent Progress in Defective Carbon-Based Oxygen Electrode Materials for Rechargeable Zink-Air Batteries. **2019**, 2, 509-523	26
159	Phosphorus-doped hierarchical porous carbon as efficient metal-free electrocatalysts for oxygen reduction reaction. **2019**, 44, 12941-12951	18
158	Electrogeneration of hydrogen peroxide using phosphorus-doped carbon nanotubes gas diffusion electrodes and its application in electro-Fenton. **2019**, 840, 400-408	29
157	Chemical Approaches to Carbon-Based Metal-Free Catalysts. **2019**, 31, e1804863	53
156	Progress in Nonmetal-Doped Graphene Electrocatalysts for the Oxygen Reduction Reaction. **2019**, 12, 2133-2146	45
155	Optimized culturing conditions for an algicidal bacterium Pseudoalteromonas sp. SP48 on harmful algal blooms caused by Alexandrium tamarense. **2019**, 8, e00803	6
154	A highly stable metal□organic framework derived phosphorus doped carbon/Cu2O structure for efficient photocatalytic phenol degradation and hydrogen production. **2019**, 7, 6062-6079	33
153	Green, single-pot synthesis of functionalized Na/N/P co-doped graphene nanosheets for high-performance supercapacitors. **2019**, 837, 30-38	18
152	The identification of active□N species in N-doped carbon carriers that improve the activity of Fe electrocatalysts towards the oxygen evolution reaction.. **2019**, 9, 4806-4811	3
151	N- and S- co-doped graphene sheet-encapsulated Co9S8 nanomaterials as excellent electrocatalysts for the oxygen evolution reaction. **2019**, 417, 90-98	35
150	Defect chemistry in 2D materials for electrocatalysis. **2019**, 12, 215-238	62
149	Carbon materials for traffic power battery. **2019**, 2, 100033	28
148	Carbon-Based Nanomaterials as Sustainable Noble-Metal-Free Electrocatalysts. **2019**, 7, 759	15
147	N-, P-, and S-doped graphene-like carbon catalysts derived from onium salts with enhanced oxygen chemisorption for Zn-air battery cathodes. **2019**, 241, 442-451	190
146	Highly efficient and acid-corrosion resistant nitrogen doped magnetic carbon nanotubes for the hexavalent chromium removal with subsequent reutilization. **2019**, 361, 547-558	26

145	Sp2-carbon dominant carbonaceous materials for energy conversion and storage. **2019**, 137, 1-37	18
144	Phosphorus-Doped Graphene as a Metal-Free Material for Thermochemical Water Reforming at Unusually Mild Conditions. **2019**, 7, 838-846	17
143	Photo-electrochemical oxidation of hypophosphite and phosphorous recovery by UV/Fe2+/peroxydisulfate with electrochemical process. **2019**, 359, 1075-1085	8
142	Ratiometric electrochemical glucose sensor based on electroactive Schiff base polymers. **2019**, 285, 264-270	36
141	Doped-Graphene Modified Electrochemical Sensors. **2019**, 67-87	2
140	Low-Cost and Highly Efficient Metal-Free Electrocatalysts for Oxygen Reduction Reaction: Environment-Friendly Three-Dimensional B, N Co-doped Graphene Aerogels. **2019**, 10, 56-62	8
139	Hierarchical design and development of nanostructured trifunctional catalysts for electrochemical oxygen and hydrogen reactions. **2019**, 56, 724-732	31
138	Hierarchical sulfur and nitrogen co-doped carbon nanocages as efficient bifunctional oxygen electrocatalysts for rechargeable Zn-air battery. **2019**, 34, 64-71	50
137	Nanodiamonds @ N, P co-modified mesoporous carbon supported on macroscopic SiC foam for oxidative dehydrogenation of ethylbenzene. **2020**, 357, 231-239	9
136	Boron-, sulfur-, and phosphorus-doped graphene for environmental applications. **2020**, 698, 134239	44
135	Phosphorus-containing carbons: Preparation, properties and utilization. **2020**, 157, 796-846	46
134	Charge Transfer Modulated Activity of Carbon-Based Electrocatalysts. **2020**, 10, 1901227	93
133	Role of radical and non-radical pathway in activating persulfate for degradation of p-nitrophenol by sulfur-doped ordered mesoporous carbon. **2020**, 384, 123304	131
132	Novel construction of nanostructured carbon materials as sulfur hosts for advanced lithium-sulfur batteries. **2020**, 44, 70-91	15
131	Tunable-quaternary (N, S, O, P)-doped porous carbon microspheres with ultramicropores for CO2 capture. **2020**, 507, 145130	24
130	Improved transport of gold(I) from aurocyanide solution using a green ionic liquid-based polymer inclusion membrane with in-situ electrodeposition. **2020**, 153, 136-145	14
129	Synthesis of amorphous and graphitized porous nitrogen-doped carbon spheres as oxygen reduction reaction catalysts. **2020**, 11, 1-15	7
128	Enhancing Chemical Interaction of Polysulfide and Carbon through Synergetic Nitrogen and Phosphorus Doping. **2020**, 8, 806-813	10

127	Sulfur modification of carbon materials as well as the redox additive of Na2S for largely improving capacitive performance of supercapacitors. **2020**, 856, 113678	9
126	A One-Pot Method to Synthesize a Co-Based Graphene-Like Structure Doped Carbon Material for the Oxygen Reduction Reaction. **2020**, 7, 131-138	3
125	Superior Oxygen Reduction Reaction on Phosphorus-Doped Carbon Dot/Graphene Aerogel for All-Solid-State Flexible Al–Air Batteries. **2020**, 10, 1902736	62
124	Co-doped carbon materials synthesized with polymeric precursors as bifunctional electrocatalysts.. **2020**, 10, 35966-35978	6
123	A facile synthesis of zeolitic analcime/spongy graphene nanocomposites as novel hybrid electrodes for symmetric supercapacitors. **2020**, 32, 101953	2
122	Heteroatom-doped carbon catalysts for zinc–air batteries: progress, mechanism, and opportunities. **2020**, 13, 4536-4563	83
121	Metal-free carbon materials for persulfate-based advanced oxidation process: Microstructure, property and tailoring. **2020**, 111, 100654	117
120	Synergistic effect on BCN nanomaterials for the oxygen reduction reaction – a kinetic and mechanistic analysis to explore the active sites. **2020**, 10, 6659-6668	0
119	Polymer-Derived Heteroatom-Doped Porous Carbon Materials. **2020**, 120, 9363-9419	196
118	Electrocatalyst design for aprotic Li–O2 batteries. **2020**, 13, 4717-4737	28
117	Metal (Mn, Fe, Co, Ni, Cu, and Zn) Phthalocyanine-Immobilized Mesoporous Carbon Nitride Materials as Durable Electrode Modifiers for the Oxygen Reduction Reaction. **2020**, 36, 12202-12212	14
116	Optimization Strategies of Preparation of Biomass-Derived Carbon Electrocatalyst for Boosting Oxygen Reduction Reaction: A Minireview. **2020**, 10, 1472	8
115	Efficient electrocatalytic activity for oxygen reduction reaction by phosphorus-doped graphene using supercritical fluid processing. **2020**, 43, 1	3
114	The first-principles calculations to explore the mechanism of oxygen diffusion on vacancy defective graphene in marine environment. **2020**, 525, 146585	9
113	Progress in Computational and Machine-Learning Methods for Heterogeneous Small-Molecule Activation. **2020**, 32, e1907865	23
112	Forming indium-carbon (In–C) bonds at the edges of graphitic nanoplatelets. **2020**, 6, 100030	4
111	Promoting Electrocatalytic Oxygen Reduction in a Model Composite Using Selective Metal Ions. **2020**, 3, 3645-3652	2
110	The Chemistry and Promising Applications of Graphene and Porous Graphene Materials. **2020**, 30, 1909035	79

109	Fabrication of a Nitrogen and Boron-Doped Reduced Graphene Oxide Membrane-Less Amperometric Sensor for Measurement of Dissolved Oxygen in a Microbial Fermentation. **2020**, 8, 44	1
108	Electro-spinning fabrication of nitrogen, phosphorus co-doped porous carbon nanofiber as an electro-chemiluminescent sensor for the determination of cyproheptadine.. **2020**, 10, 23091-23096	8
107	N-self-doped porous carbon derived from animal-heart as an electrocatalyst for efficient reduction of oxygen. **2020**, 579, 832-841	3
106	Theoretical insights into oxygen reduction reaction catalyzed by phosphorus-doped divacancy CN nanosheet. **2020**, 100, 107647	3
105	Boron-, nitrogen-, aluminum-, and phosphorus-doped graphite electrodes for non-lithium ion batteries. **2020**, 20, 988-993	3
104	Core-shell nanostructured electrocatalysts for water splitting. **2020**, 12, 15944-15969	38
103	Iron Phosphide Doped, Porous Carbon as an Efficient Electrocatalyst for Oxygen Reduction Reaction. **2020**, 3, 2537-2546	8
102	Metal-free carbocatalysis for electrochemical oxygen reduction reaction: Activity origin and mechanism. **2020**, 48, 308-321	40
101	Investigation of wet-milled graphene nanosheets with sulfur doping for lithium-ion battery. **2020**, 26, 3267-3274	6
100	Substantial Role of Nitrogen and Sulfur in Quaternary-Atom-Doped Multishelled Carbon Nanospheres for the Oxygen Evolution Reaction. **2020**, 8, 4284-4291	6
99	Functionalized halloysite template-assisted polyaniline synthesis high-efficiency iron/nitrogen-doped carbon nanotubes towards nonprecious ORR catalysts. **2020**, 13, 4954-4965	6
98	Two-dimensional materials for energy conversion and storage. **2020**, 111, 100637	73
97	Boron doping and structure control of carbon materials for supercapacitor application: the effect of freeze-drying and air-drying for porosity engineering. **2020**, 24, 641-654	10
96	Applications of metal□organic framework-derived materials in fuel cells and metal-air batteries. **2020**, 409, 213214	97
95	Heteroatom- and metalloid-doped carbon catalysts for oxygen reduction reaction: a mini-review. **2020**, 26, 1563-1589	22
94	Metal-free heteroatom-doped carbon-based catalysts for ORR: A critical assessment about the role of heteroatoms. **2020**, 165, 434-454	109
93	B, N-codoped Cu□N/B□ Composite as an Efficient Electrocatalyst for Oxygen-Reduction Reaction in Alkaline Media. **2020**, 5, 3647-3654	3
92	Urea-assisted synthesis of a Fe nanoparticle modified N-doped three-dimensional porous carbon framework for a highly efficient oxygen reduction reaction. **2020**, 44, 6932-6939	4

91	Preparation and Application of Hierarchical Porous Carbon Materials from Waste and Biomass: A Review. **2021**, 12, 1699-1724	30
90	MOF derived multi-metal oxides anchored N, P-doped carbon matrix as efficient and durable electrocatalyst for oxygen evolution reaction. **2021**, 581, 608-618	23
89	Non-N-Doped Carbons as Metal-Free Electrocatalysts. **2021**, 5, 2000134	11
88	Spontaneously producing syngas from MFC-MEC coupling system based on biocompatible bifunctional metal-free electrocatalyst. **2021**, 64, 592-600	0
87	Rapeseed meal-based autochthonous N and S-doped non-metallic porous carbon electrode material for oxygen reduction reaction catalysis. **2021**, 46, 508-517	5
86	Developing WO3 as high-performance anode material for lithium-ion batteries. **2021**, 285, 129129	6
85	Carbon-based materials for all-solid-state zinc□air batteries. **2021**, 3, 50-65	19
84	Facile synthesis of low-cost Fe3C-nitrogen and phosphorus co-doped porous carbon nanofibers: The efficient hydrogen evolution reaction catalysts. **2021**, 856, 156213	0
83	Recent progress in the development of biomass-derived nitrogen-doped porous carbon. **2021**, 9, 3703-3728	69
82	Synthesis of hierarchical interconnected graphene oxide for enhanced oxygen reduction. **2021**, 610, 125719	1
81	A Carbon Catalyst Co-Doped with P and N for Efficient and Selective Oxidation of 5-Hydroxymethylfurfural into 2,5-Diformylfuran. **2021**, 14, 456-466	7
80	Boron containing metal-organic framework for highly selective photocatalytic production of HO by promoting two-electron O reduction. **2021**, 8, 2842-2850	3
79	Laser scribed graphene for supercapacitors. **2021**, 4, 200079-200079	11
78	Two-Dimensional Pseudocapacitive Nanomaterials for High-Energy- and High-Power-Oriented Applications of Supercapacitors. **2021**, 2, 86-96	8
77	Insight into the mechanism of boron-doping of carbon aerogel for enhancing the activity of low-temperature selective catalytic reduction of NO with NH3. **2021**, 11, 2057-2072	2
76	N, P co-doped porous carbon from cross-linking cyclophosphazene for high-performance supercapacitors. **2021**, 881, 114952	2
75	N,P co-doped microporous carbon as a metal-free catalyst for the selective oxidation of alcohols by air in water. **2021**, 45, 13877-13884	2
74	Heteroatom-doped carbon-based oxygen reduction electrocatalysts with tailored four-electron and two-electron selectivity. **2021**, 57, 7350-7361	6

73	Effect of secondary heteroatom (S, P) in N-doped reduced graphene oxide catalysts to oxygen reduction reaction. **2021**, 502, 111372	4
72	Green synthesis of iron and nitrogen co-doped porous carbon via pyrolysing lotus root as a high-performance electrocatalyst for oxygen reduction reaction. **2021**, 45, 10393-10408	6
71	Planar Graphene-Based Microsupercapacitors. **2021**, 17, e2006827	7
70	Electrified Membranes for Water Treatment Applications. **2021**, 1, 725-752	33
69	A Novel Fe and Cu Bimetallic Mixed Porous Carbon Material for Oxygen Reduction. **2021**, 12, 362-371	1
68	Multi-doped carbon derived from notoginseng as a high-performance catalyst for oxygen reduction. **2021**, 27, 2537-2544	
67	N, O, P multi-doped porous carbon with superior norfloxacin sorption performance. **2021**, 290, 129478	1
66	Bimetallic ZIFs derived nitrogen-doped hollow carbon with carbon nanotube bridges as a superior oxygen reduction reaction electrocatalyst. **2021**, 97, 466-475	5
65	Interfacial Covalent Bonds Regulated Electron-Deficient 2D Black Phosphorus for Electrocatalytic Oxygen Reactions. **2021**, 33, e2008752	18
64	2D Graphitic Carbon Nitride for Energy Conversion and Storage. **2021**, 31, 2102540	42
63	Photocatalytic degradation of dinotefuran by layered phosphorus-doped carbon nitride and its mechanism. **2021**, 414, 113287	4
62	High-efficient Schottky-junction silicon solar cell using silver nanowires covering nitrogen-doped amorphous carbon. **2021**, 26, 1-8	0
61	FeS2 loading on chlorinated carbon nanotubes surface triggered by sulfur addition and their use as electrocatalyst for ORR. **2021**, 116, 108429	0
60	N, P, and S tri-doped holey carbon as an efficient electrocatalyst for oxygen reduction in whole pH range for fuel cell and zinc-air batteries. **2021**, 179, 365-376	11
59	Oxygen Reduction Reaction (ORR). **2021**, 133-165	
58	Phosphate-Assisted Dispersion of Iron Phosphide in Carbon Nanosheets towards Efficient and Durable ORR Catalysts in Acidic and Alkaline Media. **2021**, 13, 4431	1
57	Metal–organic frameworks-derived heteroatom-doped carbon electrocatalysts for oxygen reduction reaction. **2021**, 86, 106073	23
56	Computational Studies on Carbon Dots Electrocatalysis: A Review. 2107196	13

55	Highly efficient electrochemical production of hydrogen peroxide over nitrogen and phosphorus dual-doped carbon nanosheet in alkaline medium. **2021**, 896, 115197	6
54	Importance of Doping Sequence in Multiple Heteroatom-Doped Reduced Graphene Oxide as Efficient Oxygen Reduction Reaction Electrocatalysts. **2021**, 2, 267-277	
53	MoS2-modified nitrogen-doped carbon nanotubes and their applications in supercapacitors. **2021**, 32, 27184	
52	Flexible asymmetric solid-state supercapacitor of boron doped reduced graphene for high energy density and power density in energy storage device. **2021**, 118, 108495	2
51	A novel SnS2 nanomaterial based on nitrogen-doped cubic-like carbon skeleton with excellent lithium storage. **2021**, 883, 160834	8
50	Heteroatom doping in metal-free carbonaceous materials for the enhancement of persulfate activation. **2022**, 427, 131655	19
49	CoP-decorated N,P-doped necklace-like carbon for highly efficient oxygen reduction and Al-air batteries. **2022**, 428, 131326	1
48	CHAPTER 6:3D GBM-supported Transition Metal Oxide Nanocatalysts and Heteroatom-doped 3D Graphene Electrocatalysts for Potential Application in Fuel Cells. **2021**, 139-178	1
47	Phosphorus and oxygen doped carbon-based on Spirulina microalgae as efficient metal-free catalysts to obtain H2 from methanolysis of NaBH4. **2021**, 46, 3753-3762	12
46	Nanosized palladium on phosphorus-incorporated porous carbon frameworks for enhanced selective phenylacetylene hydrogenation. **2017**, 7, 4934-4939	10
45	One-step synthesis of dual-transition metal substitution on ionic liquid based N-doped mesoporous carbon for oxygen reduction reaction. **2016**, 17, 53-64	6
44	Synergistic combination of N/P dual-doped activated carbon with redox-active electrolyte for high performance supercapacitors. **2021**, 110449	3
43	Core@shell MOFs derived Co2P/CoP@NPGC as a highly-active bifunctional electrocatalyst for ORR/OER. **2021**,	6
42	Theoretical Study Oxygen Reduction Activity of Phosphorus-doped Graphene Nanoribbons. 7,	
41	Multiple roles of graphene in electrocatalysts for metal-air batteries. **2022**,	1
40	Interactions between atomically dispersed copper and phosphorous species are key for the hydrochlorination of acetylene. **2022**, 5,	2
39	Heteroatom-doped nanomaterials/core□shell nanostructure based electrocatalysts for the oxygen reduction reaction. **2022**, 10, 987-1021	5
38	Jagged carbon nanotubes from polyaniline: Strain-driven high-performance for Zn-air battery. **2022**, 434, 134617	3

37	Electrocatalysis in Alkaline Media and Alkaline Membrane-Based Energy Technologies.. **2022**,	25
36	Facile synthesis of phosphorus/oxygen co-doped hierarchically porous carbon nanosheets using a layered nanoreactor and moderate porosity for high-performance supercapacitor electrodes. **2022**, 33, 5501	0
35	Advanced carbon-based nanostructured materials for fuel cells. **2022**, 201-227	
34	Enhancing Oxygen Reduction Reaction Activity Using Single Atom Catalyst Supported on Tantalum Pentoxide.	0
33	Coordination environment of active sites and their effect on catalytic performance of heterogeneous catalysts. **2022**, 43, 928-955	0
32	Two-Dimensional Biphenylene: A Graphene Allotrope with Superior Activity toward Electrochemical Oxygen Reduction Reaction.. **2021**, 12, 12230-12234	1
31	Defect engineering of carbons for energy conversion and storage applications.	2
30	Scalable Fabrication of Core-Shell Fep@N-Ppc Catalyst with a Superior Activity Towards Oxygen Evolution Reaction in Industrial Basic Medium.	
29	The influence of heteroatom doping on the performance of carbon-based electrocatalysts for oxygen evolution reactions. **2022**, 37, 321-336	1
28	Structural and Chemical Peculiarities of Nitrogen-Doped Graphene Grown Using Direct Microwave Plasma-Enhanced Chemical Vapor Deposition. **2022**, 12, 572	
27	Carbon-based metal-free oxygen reduction reaction electrocatalysts: past, present and future. **2022**, 37, 338-354	0
26	Heterogeneous carbon metal-free catalysts. **2022**, 195-212	
25	Nanocarbon-based metal-free catalysts. **2022**, 1-19	
24	One-step fabrication of porous carbon microspheres with in situ self-doped N, P, and O for the removal of anionic and cationic dyes. **2022**, 126, 109123	0
23	Oxygen reduction reaction by metal-free catalysts. **2022**, 241-275	
22	High-Quality N-Doped Graphene with Controllable Nitrogen Bonding Configurations Derived from Ionic Liquids.	
21	Transition Metal Non-Oxides as Electrocatalysts: Advantages and Challenges. 2202033	4
20	N, P co-doped graphene enriched Phosphorus as a highly efficient oxygen reduction catalyst. **2022**, 116560	1

19	Theoretical Inspection of TM-P4C Single-Atom Electrocatalysts: High Performance for Oxygen Reduction and Evolution Reactions. **2022**, 140853	
18	Graphene-Based Materials for Electrocatalysis. **2022**, 245-273	
17	A correlation of the hydrogen evolution reaction activity to the number of defects formed by the decomposition of doped phosphorus species in carbon nanotubes. **2022**, 37, 773-780	
16	Improving the electrophilicity of nitrogen on nitrogen-doped carbon triggers oxygen reduction by introducing covalent vanadium nitride.	0
15	Nitrogen-doped carbon nanotubes filled with Fe3C nanowires for efficient electrocatalytic oxygen reduction. **2022**, 654, 130095	0
14	Carbon-Based Nanomaterials for Oxygen Evolution Reaction. **2022**, 147-167	0
13	P-doped porous carbon derived from walnut shell for zinc ion hybrid capacitors. **2022**, 12, 24724-24733	0
12	N doped FeP nanospheres decorated carbon matrix as an efficient electrocatalyst for durable lithium-sulfur batteries. **2023**, 630, 70-80	0
11	Quantification of electron transfer on carbon nanotubes: Effect of edge defects on electro-oxidation of glycerol catalyzed by platinum. **2023**, 455, 140826	0
10	Mechanism Exploration and Catalyst Design for Hydrogen Evolution Reaction Accelerated by Density Functional Theory Simulations. **2023**, 11, 467-481	0
9	ORR Catalysts Derived from Biopolymers. **2023**, 13, 80	0
8	Recent Progress of Non-Pt Catalysts for Oxygen Reduction Reaction in Fuel Cells. **2023**, 11, 361	0
7	Nanoparticle-decorated graphene/graphene oxide: synthesis, properties and applications.	0
6	Phosphorous- and Boron-Doped Graphene-Based Nanomaterials for Energy-Related Applications. **2023**, 16, 1155	1
5	Bamboo fiber-derived bifunctional electrocatalyst for rechargeable Zn- Air batteries.	0
4	Mechanism study on the interaction between holocellulose and lignin during secondary pyrolysis of biomass: In terms of molecular model compounds. **2023**, 244, 107701	0
3	Influence of phosphorus-doped bilayer graphene configuration on the oxygen reduction reaction in acidic solution. **2023**, 118012	0
2	Reduced graphene oxide supported Fe2B as robust catalysts for oxygen reduction reaction. **2023**,	0

1	Multi-heteroelement-doped porous carbon as an efficient catalyst for alkaline oxygen reduction reaction. **2023**, 109957	0