Haiguang zhao

List of Publications by Year in Descending Order

131 papers	4,406 citations	39 h-index	60 g-index
139 ext. papers	5,490 ext. citations	11.2 avg, IF	6.05 L-index

#	Paper	IF	Citations
131	Structural effect of Low-dimensional carbon nanostructures on Long-term stability of dye sensitized solar cells. *Chemical Engineering Journal*, **2022**, 435, 135037	14.7	1
130	Ultra-small-sized multi-element metal oxide nanofibers: an efficient electrocatalyst for hydrogen evolution. *Nanoscale Advances*, **2022**, 4, 1758-1769	5.1	0
129	Platinum Cluster/Carbon Quantum Dots Derived Graphene Heterostructured Carbon Nanofibers for Efficient and Durable Solar-Driven Electrochemical Hydrogen Evolution.. *Small Methods*, **2022**, e2101470	12.8	3
128	Highly efficient optoelectronic devices based on colloidal heterostructured quantum dots. *APL Materials*, **2021**, 9, 050701	5.7	0
127	Stable metal-halide perovskites for luminescent solar concentrators of real-device integration. *Nano Energy*, **2021**, 85, 105960	17.1	16
126	Efficient and stable photoelectrochemical hydrogen generation using optimized colloidal heterostructured quantum dots. *Nano Energy*, **2021**, 79, 105416	17.1	15
125	Gold nanoparticle decorated carbon nanotube nanocomposite for dye-sensitized solar cell performance and stability enhancement. *Chemical Engineering Journal*, **2021**, 421, 127756	14.7	4
124	Gram-scale synthesis of carbon quantum dots with a large Stokes shift for the fabrication of eco-friendly and high-efficiency luminescent solar concentrators. *Energy and Environmental Science*, **2021**, 14, 396-406	35.4	81
123	Red and yellow emissive carbon dots integrated tandem luminescent solar concentrators with significantly improved efficiency. *Nanoscale*, **2021**, 13, 9561-9569	7.7	10
122	Near-infrared heavy-metal-free SnSe/ZnSe quantum dots for efficient photoelectrochemical hydrogen generation. *Nanoscale*, **2021**, 13, 3519-3527	7.7	7
121	Thermal effect on the efficiency and stability of luminescent solar concentrators based on colloidal quantum dots. *Journal of Materials Chemistry C*, **2021**, 9, 5723-5731	7.1	3
120	Surface chemistry in calcium capped carbon quantum dots. *Nanoscale*, **2021**, 13, 12149-12156	7.7	2
119	Rational synthesis of novel "giant" CuInTeSe/CdS core/shell quantum dots for optoelectronics. *Nanoscale*, **2021**, 13, 15301-15310	7.7	1
118	Ceria doping boosts methylene blue photodegradation in titania nanostructures. *Materials Chemistry Frontiers*, **2021**, 5, 4138-4152	7.8	5
117	Quantum Dots: Quantum Dots-Based Photoelectrochemical Hydrogen Evolution from Water Splitting (Adv. Energy Mater. 12/2021). *Advanced Energy Materials*, **2021**, 11, 2170047	21.8	
116	Colloidal carbon quantum dots as light absorber for efficient and stable ecofriendly photoelectrochemical hydrogen generation. *Nano Energy*, **2021**, 86, 106122	17.1	18
115	Concus Finn Capillary driven fast viscous oil-spills removal by superhydrophobic cruciate polyester fibers. *Journal of Hazardous Materials*, **2021**, 417, 126133	12.8	9

114	Red and green-emitting biocompatible carbon quantum dots for efficient tandem luminescent solar concentrators. *Journal of Materials Chemistry C*, **2021**, 9, 12255-12262	7.1	5
113	Highly efficient ratiometric nanothermometers based on colloidal carbon quantum dots. *Journal of Materials Chemistry B*, **2021**, 9, 4111-4119	7.3	8
112	Quantum Dots-Based Photoelectrochemical Hydrogen Evolution from Water Splitting. *Advanced Energy Materials*, **2021**, 11, 2003233	21.8	12
111	3D Ordered Porous Hybrid of ZnSe/ N -doped Carbon with Anomalously High Na + Mobility and Ultrathin Solid Electrolyte Interphase for Sodium-Ion Batteries (Adv. Funct. Mater. 50/2021). *Advanced Functional Materials*, **2021**, 31, 2170372	15.6	
110	Earth abundant colloidal carbon quantum dots for luminescent solar concentrators. *Materials Advances*, **2020**, 1, 119-138	3.3	20
109	Tailoring the Heterostructure of Colloidal Quantum Dots for Ratiometric Optical Nanothermometry. *Small*, **2020**, 16, e2000804	11	15
108	Synthesis of highly efficient Cu2ZnSnSxSe4 (CZTSSe) nanosheet electrocatalyst for dye-sensitized solar cells. *Electrochimica Acta*, **2020**, 340, 135954	6.7	10
107	1D/2D Cobalt-Based Nanohybrids as Electrocatalysts for Hydrogen Generation. *Advanced Functional Materials*, **2020**, 30, 1908467	15.6	19
106	Core/Shell Quantum Dots Solar Cells. *Advanced Functional Materials*, **2020**, 30, 1908762	15.6	53
105	Role of Carbon Nanotubes to Enhance the Long-Term Stability of Dye-Sensitized Solar Cells. *ACS Photonics*, **2020**, 7, 653-664	6.3	10
104	Role of refractive index in highly efficient laminated luminescent solar concentrators. *Nano Energy*, **2020**, 70, 104470	17.1	13
103	Electron transfer in a semiconductor heterostructure interface through electrophoretic deposition and a linker-assisted method. *CrystEngComm*, **2020**, 22, 1664-1673	3.3	4
102	Environmentally friendly Mn-alloyed core/shell quantum dots for high-efficiency photoelectrochemical cells. *Journal of Materials Chemistry A*, **2020**, 8, 10736-10741	13	20
101	Encapsulation of Dual Emitting Giant Quantum Dots in Silica Nanoparticles for Optical Ratiometric Temperature Nanosensors. *Applied Sciences (Switzerland)*, **2020**, 10, 2767	2.6	5
100	Core/Shell Quantum-Dot-Based Luminescent Solar Concentrators. *Lecture Notes in Nanoscale Science and Technology*, **2020**, 287-314	0.3	
99	Perovskite Quantum Dots Based Luminescent Solar Concentrators. *Springer Series in Materials Science*, **2020**, 219-242	0.9	1
98	Hybrid graphene/metal oxide anodes for efficient and stable dye sensitized solar cell. *Electrochimica Acta*, **2020**, 349, 136409	6.7	21
97	Efficient and stable hydrogen evolution based on earth-abundant SnSe nanocrystals. *Applied Catalysis B: Environmental*, **2020**, 264, 118526	21.8	10

96	Low-Cost, Air-Processed Quantum Dot Solar Cells via Diffusion-Controlled Synthesis. *ACS Applied Materials & Interfaces*, **2020**, 12, 36301-36310	9.5	5
95	A high performance wearable strain sensor with advanced thermal management for motion monitoring. *Nature Communications*, **2020**, 11, 3530	17.4	141
94	Hybrid surface passivation of PbS/CdS quantum dots for efficient photoelectrochemical hydrogen generation. *Applied Surface Science*, **2020**, 530, 147252	6.7	12
93	In-situ growth of graphene on carbon nanofiber from lignin. *Carbon*, **2020**, 169, 446-454	10.4	17
92	Synergistic Effect of Plasmonic Gold Nanoparticles Decorated Carbon Nanotubes in Quantum Dots/TiO for Optoelectronic Devices. *Advanced Science*, **2020**, 7, 2001864	13.6	18
91	Graphene nanoribbon-TiO2-quantum dots hybrid photoanode to boost the performance of photoelectrochemical for hydrogen generation. *Catalysis Today*, **2020**, 340, 161-169	5.3	12
90	Quantum Dots Solar Cells: Core/Shell Quantum Dots Solar Cells (Adv. Funct. Mater. 13/2020). *Advanced Functional Materials*, **2020**, 30, 2070086	15.6	6
89	Enhanced Photocurrent Generation in Proton-Irradiated Giant CdSe/CdS Core/Shell Quantum Dots. *Advanced Functional Materials*, **2019**, 29, 1904501	15.6	9
88	Visible and Near-Infrared, Multiparametric, Ultrasensitive Nanothermometer Based on Dual-Emission Colloidal Quantum Dots. *ACS Photonics*, **2019**, 6, 2479-2486	6.3	20
87	A colloidal heterostructured quantum dot sensitized carbon nanotube-TiO hybrid photoanode for high efficiency hydrogen generation. *Nanoscale Horizons*, **2019**, 4, 404-414	10.8	24
86	Zero-Dimensional Perovskite Nanocrystals for Efficient Luminescent Solar Concentrators. *Advanced Functional Materials*, **2019**, 29, 1902262	15.6	102
85	Hole-extraction and photostability enhancement in highly efficient inverted perovskite solar cells through carbon dot-based hybrid material. *Nano Energy*, **2019**, 62, 781-790	17.1	58
84	Refractive index dependent optical property of carbon dots integrated luminescent solar concentrators. *Journal of Luminescence*, **2019**, 211, 150-156	3.8	19
83	Efficient solar-driven hydrogen generation using colloidal heterostructured quantum dots. *Journal of Materials Chemistry A*, **2019**, 7, 14079-14088	13	22
82	Ultra-small colloidal heavy-metal-free nanoplatelets for efficient hydrogen generation. *Applied Catalysis B: Environmental*, **2019**, 250, 234-241	21.8	11
81	High efficiency sandwich structure luminescent solar concentrators based on colloidal quantum dots. *Nano Energy*, **2019**, 60, 119-126	17.1	31
80	Near-Infrared Colloidal Manganese-Doped Quantum Dots: Photoluminescence Mechanism and Temperature Response. *ACS Photonics*, **2019**, 6, 2421-2431	6.3	12
79	Highly efficient and stable spray assisted nanostructured Cu2S/Carbon paper counter electrode for quantum dots sensitized solar cells. *Journal of Power Sources*, **2019**, 436, 226849	8.9	24

78	Integration of photoelectrochemical devices and luminescent solar concentrators based on giant quantum dots for highly stable hydrogen generation. *Journal of Materials Chemistry A*, **2019**, 7, 18529-18537	13	15
77	A stretchable laminated GNRs/BNNSs nanocomposite with high electrical and thermal conductivity. *Nanoscale*, **2019**, 11, 20648-20658	7.7	21
76	High-performance laminated luminescent solar concentrators based on colloidal carbon quantum dots. *Nanoscale Advances*, **2019**, 1, 4888-4894	5.1	18
75	Epitaxial growth and defect repair of heterostructured CuInSeS/CdSeS/CdS quantum dots. *Nanoscale*, **2019**, 11, 19529-19535	7.7	1
74	Graphene oxide/cobalt-based nanohybrid electrodes for robust hydrogen generation. *Applied Catalysis B: Environmental*, **2019**, 245, 167-176	21.8	15
73	CuS/Graphene Nanocomposite as a Transparent Conducting Oxide and Pt-Free Counter Electrode for Dye-Sensitized Solar Cells. *Journal of the Electrochemical Society*, **2019**, 166, H3065-H3073	3.9	15
72	Interfacial engineering in colloidal □giant□quantum dots for high-performance photovoltaics. *Nano Energy*, **2019**, 55, 377-388	17.1	27
71	Heterostructured quantum dot architectures for efficient and stable photoelectrochemical hydrogen production. *Journal of Materials Chemistry A*, **2018**, 6, 6822-6829	13	34
70	Towards Long-Term Thermal Stability of Dye-Sensitized Solar Cells Using Multiwalled Carbon Nanotubes. *ChemPlusChem*, **2018**, 83, 682-690	2.8	14
69	Structure/Property Relations in "Giant" Semiconductor Nanocrystals: Opportunities in Photonics and Electronics. *Accounts of Chemical Research*, **2018**, 51, 609-618	24.3	43
68	Anionic polypeptide poly(□glutamic acid)-functionalized magnetic Fe3O4-GO-(o-MWCNTs) hybrid nanocomposite for high-efficiency removal of Cd(II), Cu(II) and Ni(II) heavy metal ions. *Chemical Engineering Journal*, **2018**, 346, 38-49	14.7	69
67	Near-Infrared, Heavy Metal-Free Colloidal □Giant□Core/Shell Quantum Dots. *Advanced Energy Materials*, **2018**, 8, 1701432	21.8	68
66	Highly stable photoelectrochemical cells for hydrogen production using a SnO-TiO/quantum dot heterostructured photoanode. *Nanoscale*, **2018**, 10, 15273-15284	7.7	23
65	Stable tandem luminescent solar concentrators based on CdSe/CdS quantum dots and carbon dots. *Journal of Materials Chemistry C*, **2018**, 6, 10059-10066	7.1	43
64	Colloidal thick-shell pyramidal quantum dots for efficient hydrogen production. *Nano Energy*, **2018**, 53, 116-124	17.1	24
63	Efficient and stable tandem luminescent solar concentrators based on carbon dots and perovskite quantum dots. *Nano Energy*, **2018**, 50, 756-765	17.1	113
62	Harnessing the properties of colloidal quantum dots in luminescent solar concentrators. *Chemical Society Reviews*, **2018**, 47, 5866-5890	58.5	120
61	Colloidal carbon dots based highly stable luminescent solar concentrators. *Nano Energy*, **2018**, 44, 378-387	17.1	102

60	Near-infrared CdSexTe1-x@CdS "giant" quantum dots for efficient photoelectrochemical hydrogen generation. *International Journal of Hydrogen Energy*, **2018**, 43, 22064-22074	6.7	14
59	Direct Measurement of Electronic Band Structure in Single Quantum Dots of Metal Chalcogenide Composites. *Small*, **2018**, 14, e1801668	11	15
58	Tailoring the interfacial structure of colloidal "giant" quantum dots for optoelectronic applications. *Nanoscale*, **2018**, 10, 17189-17197	7.7	16
57	Hybrid TiO2-Graphene nanoribbon photoanodes to improve the photoconversion efficiency of dye sensitized solar cells. *Journal of Power Sources*, **2018**, 396, 566-573	8.9	28
56	Optoelectronic Properties in Near-Infrared Colloidal Heterostructured Pyramidal "Giant" Core/Shell Quantum Dots. *Advanced Science*, **2018**, 5, 1800656	13.6	49
55	Perovskite quantum dots integrated in large-area luminescent solar concentrators. *Nano Energy*, **2017**, 37, 214-223	17.1	117
54	Ultrasmall Nanoplatelets: The Ultimate Tuning of Optoelectronic Properties. *Advanced Energy Materials*, **2017**, 7, 1602728	21.8	27
53	Ultrasmall PbS quantum dots: a facile and greener synthetic route and their high performance in luminescent solar concentrators. *Journal of Materials Chemistry A*, **2017**, 5, 10250-10260	13	33
52	Enhanced conversion efficiency in Si solar cells employing photoluminescent down-shifting CdSe/CdS core/shell quantum dots. *Scientific Reports*, **2017**, 7, 14104	4.9	35
51	Dual emission and optical gain in PbS/CdS nanocrystals: Role of shell volume and of core/shell interface. *Physical Review B*, **2017**, 96,	3.3	13
50	Controlled synthesis of near-infrared quantum dots for optoelectronic devices. *Nanoscale*, **2017**, 9, 16843-16851	7.7	15
49	Colloidal Quantum Dots for Solar Technologies. *CheM*, **2017**, 3, 229-258	16.2	77
48	Highly Stable Colloidal "giant" Quantum Dots Sensitized Solar Cells. *Advanced Functional Materials*, **2017**, 27, 1701468	15.6	68
47	Nanofiber-supported CuS nanoplatelets as high efficiency counter electrodes for quantum dot-based photoelectrochemical hydrogen production. *Materials Chemistry Frontiers*, **2017**, 1, 65-72	7.8	18
46	Heavy metal-free, near-infrared colloidal quantum dots for efficient photoelectrochemical hydrogen generation. *Nano Energy*, **2017**, 31, 441-449	17.1	97
45	Green synthesis of near infrared core/shell quantum dots for photocatalytic hydrogen production. *Nanotechnology*, **2016**, 27, 495405	3.4	20
44	Towards understanding the unusual photoluminescence intensity variation of ultrasmall colloidal PbS quantum dots with the formation of a thin CdS shell. *Physical Chemistry Chemical Physics*, **2016**, 18, 31828-31835	3.6	11
43	Engineering interfacial structure in "giant" PbS/CdS quantum dots for photoelectrochemical solar energy conversion. *Nano Energy*, **2016**, 30, 531-541	17.1	70

42	Platinum/Palladium hollow nanofibers as high-efficiency counter electrodes for enhanced charge transfer. *Journal of Power Sources*, **2016**, 335, 138-145	8.9	33
41	Enhanced photovoltaic properties in dye sensitized solar cells by surface treatment of SnO2 photoanodes. *Scientific Reports*, **2016**, 6, 23312	4.9	59
40	Lanthanide Ion Doped Upconverting Nanoparticles: Synthesis, Structure and Properties. *Small*, **2016**, 12, 3888-907	11	72
39	Quantum Dots: Near-Infrared Colloidal Quantum Dots for Efficient and Durable Photoelectrochemical Solar-Driven Hydrogen Production (Adv. Sci. 3/2016). *Advanced Science*, **2016** , 3,	13.6	78
38	Near-Infrared Colloidal Quantum Dots for Efficient and Durable Photoelectrochemical Solar-Driven Hydrogen Production. *Advanced Science*, **2016**, 3, 1500345	13.6	55
37	Silver nanoparticle film induced photoluminescence enhancement of near-infrared emitting PbS and PbS/CdS core/shell quantum dots: observation of different enhancement mechanisms. *Nanoscale*, **2016**, 8, 4882-7	7.7	16
36	Dual emission in asymmetric "giant" PbS/CdS/CdS core/shell/shell quantum dots. *Nanoscale*, **2016**, 8, 4217-26	7.7	48
35	Near Infrared, Highly Efficient Luminescent Solar Concentrators. *Advanced Energy Materials*, **2016**, 6, 1501913	21.8	115
34	High efficiency, Pt-free photoelectrochemical cells for solar hydrogen generation based on □giant□ quantum dots. *Nano Energy*, **2016**, 27, 265-274	17.1	79
33	Functionalized multi-wall carbon nanotubes/TiO2 composites as efficient photoanodes for dye sensitized solar cells. *Journal of Materials Chemistry C*, **2016**, 4, 3555-3562	7.1	56
32	Solar Concentrators: Absorption Enhancement in □Giant□Core/Alloyed-Shell Quantum Dots for Luminescent Solar Concentrator (Small 38/2016). *Small*, **2016**, 12, 5368-5368	11	1
31	Absorption Enhancement in "Giant" Core/Alloyed-Shell Quantum Dots for Luminescent Solar Concentrator. *Small*, **2016**, 12, 5354-5365	11	88
30	Ultrasensitive, Biocompatible, Self-Calibrating, Multiparametric Temperature Sensors. *Small*, **2015**, 11, 5741-6	11	36
29	Dynamics of semiconducting nanocrystal uptake into mesoporous TiO2 thick films by electrophoretic deposition. *Journal of Materials Chemistry A*, **2015**, 3, 847-856	13	22
28	Temperature Sensors: Ultrasensitive, Biocompatible, Self-Calibrating, Multiparametric Temperature Sensors (Small 43/2015). *Small*, **2015**, 11, 5740-5740	11	
27	Air-processed depleted bulk heterojunction solar cells based on PbS/CdS core□shell quantum dots and TiO2 nanorod arrays. *Solar Energy Materials and Solar Cells*, **2014**, 124, 67-74	6.4	34
26	Controlling photoinduced electron transfer from PbS@CdS core@shell quantum dots to metal oxide nanostructured thin films. *Nanoscale*, **2014**, 6, 7004-11	7.7	69
25	Investigating photoinduced charge transfer in double- and single-emission PbS@CdS core@shell quantum dots. *Nanoscale*, **2014**, 6, 215-25	7.7	45

24	Size Dependence of Temperature-Related Optical Properties of PbS and PbS/CdS Core/Shell Quantum Dots. *Journal of Physical Chemistry C*, **2014**, 118, 20585-20593	3.8	49
23	Microwave-assisted cation exchange toward synthesis of near-infrared emitting PbS/CdS core/shell quantum dots with significantly improved quantum yields through a uniform growth path. *Nanoscale*, **2013**, 5, 7800-4	7.7	32
22	Asymmetric silver "nanocarrot" structures: solution synthesis and their asymmetric plasmonic resonances. *Journal of the American Chemical Society*, **2013**, 135, 9616-9	16.4	38
21	Effect of Redox Reaction Products on the Luminescence Switching Behavior in CePO4:Tb Nanorods. *Journal of Physical Chemistry C*, **2013**, 117, 10031-10038	3.8	25
20	Silver Nanorice Structures: Oriented Attachment-Dominated Growth, High Environmental Sensitivity, and Real-Space Visualization of Multipolar Resonances. *Chemistry of Materials*, **2012**, 24, 2339-2346	9.6	64
19	Towards controlled synthesis and better understanding of highly luminescent PbS/CdS core/shell quantum dots. *Journal of Materials Chemistry*, **2011**, 21, 8898		115
18	Effect of CdS shell thickness on the optical properties of water-soluble, amphiphilic polymer-encapsulated PbS/CdS core/shell quantum dots. *Journal of Materials Chemistry*, **2011**, 21, 17483		66
17	Effect of Different Types of Surface Ligands on the Structure and Optical Property of Water-Soluble PbS Quantum Dots Encapsulated by Amphiphilic Polymers. *Journal of Physical Chemistry C*, **2011**, 115, 1620-1626	3.8	35
16	Ultrafast exciton relaxation dynamics of PbS and core/shell PbS/CdS quantum dots. *Science China Chemistry*, **2011**, 54, 2009-2015	7.9	16
15	Controlled Fabrication of PbS Quantum-Dot/Carbon-Nanotube Nanoarchitecture and its Significant Contribution to Near-Infrared Photon-to-Current Conversion. *Advanced Functional Materials*, **2011**, 21, 4010-4018	15.6	79
14	Concentration-Dependent Photoinduced Photoluminescence Enhancement in Colloidal PbS Quantum Dot Solution. *Journal of Physical Chemistry C*, **2010**, 114, 10153-10159	3.8	42
13	Tuning the Charge-Transfer Property of PbS-Quantum Dot/TiO2-Nanobelt Nanohybrids via Quantum Confinement. *Journal of Physical Chemistry Letters*, **2010**, 1, 1030-1035	6.4	117
12	Self-selective recovery of photoluminescence in amphiphilic polymer encapsulated PbS quantum dots. *Physical Chemistry Chemical Physics*, **2010**, 12, 14754-61	3.6	25
11	Two-step synthesis of high-quality water-soluble near-infrared emitting quantum dots via amphiphilic polymers. *Chemical Communications*, **2010**, 46, 5301-3	5.8	75
10	Ligand and precursor effects on the synthesis and optical properties of PbS quantum dots. *Journal of Nanoscience and Nanotechnology*, **2010**, 10, 4897-905	1.3	6
9	A composite scaffold of PLGA microspheres/fibrin gel for cartilage tissue engineering: fabrication, physical properties, and cell responsiveness. *Journal of Biomedical Materials Research - Part B Applied Biomaterials*, **2009**, 88, 240-9	3.5	23
8	A polylactide/fibrin gel composite scaffold for cartilage tissue engineering: fabrication and an in vitro evaluation. *Journal of Materials Science: Materials in Medicine*, **2009**, 20, 135-43	4.5	35
7	Fabrication and properties of injectable tricalcium phosphate particles/fibrin gel composite scaffolds for bone tissue engineering. *Materials Science and Engineering C*, **2009**, 29, 836-842	8.3	15

6	Bimodal Photoluminescence during the Growth of PbS Quantum Dots. *Journal of Physical Chemistry C*, **2009**, 113, 6497-6504	3.8	48
5	Fabrication and properties of mineralized collagen-chitosan/hydroxyapatite scaffolds. *Polymers for Advanced Technologies*, **2008**, 19, 1590	3.2	21
4	Fabrication and physical and biological properties of fibrin gel derived from human plasma. *Biomedical Materials (Bristol)*, **2008**, 3, 015001	3.5	73
3	In vitro and in vivo biological performance of collagen-chitosan/silicone membrane bilayer dermal equivalent. *Journal of Materials Science: Materials in Medicine*, **2007**, 18, 2185-91	4.5	37
2	Highly efficient tandem luminescent solar concentrators based on eco-friendly copper iodide based hybrid nanoparticles and carbon dots. *Energy and Environmental Science*,	35.4	6
1	3D Ordered Porous Hybrid of ZnSe/N-doped Carbon with Anomalously High Na+ Mobility and Ultrathin Solid Electrolyte Interphase for Sodium-Ion Batteries. *Advanced Functional Materials*,2106194	15.6	21