Scientometric review of sustainable fire-resistant polysaccharide-based composite aerogels

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SUPPLEMENTARY MATERIAL

Tables were generated from VOSviewer and Biblioshiny software

Data was obtained from Scopus database

Table S1: Document search in Scopus database and resulting documents as of June 2023.

Parameters	**Settings**
TITLE-ABS-KEY	(flame AND retardant AND aerogel)
Period	2003-2023
Doc Type	Articles and Review
Source Type	Journal

Language	English
Total Documents	243

Note: *TITLE-ABS-KEY means Title, Abstract, and Keywords*

Table S2: List of the primary sources in the relevant field of study

S/N	Source	Documents	Citations	Total link strength
1	ACS Applied Materials and Interfaces	16	1054	2113
2	Chemical Engineering Journal	14	614	1041
3	Composites Part B: Engineering	10	238	1744
4	ACS Sustainable Chemistry and Engineering	9	565	1331
5	Carbohydrate Polymers	9	469	892
6	Composites Part A: Applied Science and Manufacturing	7	149	673
7	Polymers	7	125	830
8	Cellulose	6	74	572
9	Journal Of Applied Polymer Science	6	87	326
10	Journal Of Hazardous Materials	6	266	546
11	ACS Applied Polymer Materials	5	36	581
12	Industrial And Engineering Chemistry Research	5	38	255
13	ACS Applied Nano Materials	4	24	241
14	International Journal of Biological Macromolecules	4	14	209

15	Journal Of Materials Chemistry A	4	183	315
16	Materials and Design	4	129	221
17	Polymer Degradation and Stability	4	50	339
18	Applied Clay Science	3	31	470
19	Applied Surface Science	3	85	360
20	Composites Communications	3	46	244
21	Composites Science and Technology	3	151	180
22	Construction and Building Materials	3	74	60
23	Polymers for Advanced Technologies	3	65	624
24	ACS Nano	2	82	33
25	Advanced Functional Materials	2	115	144
26	Colloids and Surfaces A: Physicochemical and Engineering Aspects	2	3	249
27	Frontiers in Materials	2	13	118
28	International Journal of Molecular Sciences	2	1	165
29	Journal of Colloid and Interface Science	2	13	80
30	Journal of Energy Storage	2	14	16
31	Journal of Materials Science and Technology	2	75	313
32	Journal of Porous Materials	2	2	21
33	Journal of the Taiwan Institute of Chemical Engineers	2	12	242
34	Journal of the Textile Institute	2	37	24
35	Materials	2	56	200
36	Nano Energy	2	77	69
37	Polymer Engineering and Science	2	10	175
38	Polymer Reviews	2	59	744
39	Progress In Organic Coatings	2	4	111
40	RSC Advances	2	21	219

Table S3: List of the top cited documents

S/N	Document	Document Title	Citations	Total link strength	Ref
1	Wicklein B. (2015)	Thermally insulating and fire-retardant lightweight anisotropic foams based on nanocellulose and graphene oxide	975	97	[1]
2	Liang C. (2020)	Ultra-light MXene aerogel/wood-derived porous carbon composites with wall-like “mortar/brick” structures for electromagnetic interference shielding	299	13	[2]
3	Wang N.-N. (2019)	Robust, Lightweight, Hydrophobic, and Fire-Retarded Polyimide/MXene Aerogels for Effective Oil/Water Separation	162	60	[3]

4	Wang D. (2020)	Biomimetic structural cellulose nanofiber aerogels with exceptional mechanical, flame-retardant and thermal-insulating properties	130	221	[4]
5	Luo Y. (2021)	Flame-retardant and form-stable phase change composites based on MXene with high thermostability and thermal conductivity for thermal energy storage	106	21	[5]
6	He C. (2018)	Mechanically Resistant and Sustainable Cellulose-Based Composite Aerogels with Excellent Flame Retardant, Sound-Absorption, and Superantiwetting Ability for Advanced Engineering Materials	104	255	[6]
7	Maleki H. (2018)	Compressible, Thermally Insulating, and Fire Retardant Aerogels through Self-Assembling Silk Fibroin Biopolymers Inside a Silica Structure—An Approach towards 3D Printing of Aerogels	102	124	[7]
8	Wang Y. (2020)	Multifunctional polyimide aerogel textile inspired by polar bear hair for thermoregulation in extreme environments	97	61	[8]
9	Cao Y (2022)	Flame-retardant and leakage-proof phase change composites based on MXene/polyimide aerogels toward solar thermal energy harvesting	96	26	[9]
10	Pirzada T. (2020)	Cellulose Silica Hybrid Nanofiber Aerogels: From Sol–Gel Electrospun Nanofibers to Multifunctional Aerogels	89	119	[10]
11	Zhang Q. (2017)	Flyweight, Superelastic, Electrically Conductive, and Flame-Retardant 3D Multi-Nanolayer Graphene/Ceramic Metamaterial	80	81	[11]
12	Kang W. (2020)	A novel robust adsorbent for efficient oil/water separation: Magnetic carbon nanospheres/graphene composite aerogel	74	33	[12]
13	Carosio F. (2018)	Graphene Oxide Exoskeleton to Produce Self-Extinguishing, Nonignitable, and Flame Resistant Flexible Foams: A Mechanically Tough Alternative to Inorganic Aerogels	55	134	[13]

14	Ahmed A. (2019)	Fire-retardant, self-extinguishing triboelectric nanogenerators	47	60	[14]
15	Zhang Z.-H. (2022)	Silicone/graphene oxide co-cross-linked aerogels with wide-temperature mechanical flexibility, super-hydrophobicity and flame resistance for exceptional thermal insulation and oil/water separation	46	154	[15]
16	Zhao K. (2020)	Charged graphene aerogel filter enabled superior particulate matter removal efficiency in harsh environment	44	18	[16]
17	Sheng X. (2019)	Synergistic Effects of Two-Dimensional MXene and Ammonium Polyphosphate on Enhancing the Fire Safety of Polyvinyl Alcohol Composite Aerogels	36	140	[17]
18	Lee H. (2019)	Super-insulating, flame-retardant, and flexible poly(dimethylsiloxane) composites based on silica aerogel	34	102	[18]
19	Sun J. (2021)	Thermal-insulating, flame-retardant and mechanically resistant aerogel based on bio-inspired tubular cellulose	31	86	[19]
20	Du Y. (2022)	Ultralight, highly compressible, thermally stable MXene/aramid nanofiber anisotropic aerogels for electromagnetic interference shielding	30	22	[20]
21	Zhang Z. (2019)	Resilient, fire-retardant and mechanically strong polyimide-polyvinylpolymethylsiloxane composite aerogel prepared via stepwise chemical liquid deposition	30	80	[21]
22	Qian Z. (2019)	Triboelectric nanogenerators made of polybenzazole aerogels as fire-resistant negative tribo-materials	30	21	[22]
23	Motahari S. (2015)	Thermal and Flammability Properties of Polypropylene/Silica Aerogel Composites	30	7	[23]
24	Tian J. (2022)	Highly flexible and compressible polyimide/silica aerogels with integrated double network for thermal insulation and fire-retardancy	29	167	[24]

25	Le D.K. (2019)	Applications of functionalized polyethylene terephthalate aerogels from plastic bottle waste	27	50	[25]
26	Yang Y. (2021)	Flame-Retardant Host–Guest Films for Efficient Thermal Management of Cryogenic Devices	26	23	[26]
27	Chen F. (2018)	Heat insulating, fire retardant and flexible inorganic nanocomposite paper	26	45	[27]
28	Li Z. (2019)	Reducing the flammability of hydrophobic silica aerogels by doping with hydroxides	25	239	[28]
29	Cheng H. (2016)	Super flame-retardant lightweight rime-like carbon-phenolic nanofoam	25	56	[29]
30	Shu R. (2022)	Facile construction of three-dimensional porous netlike reduced graphene oxide/zinc oxide composite aerogels as the lightweight, flame retardant, compression resilience and high-performance electromagnetic wave absorbers	24	5	[30]
31	Zuo B. (2021)	Flame-retardant cellulose nanofiber aerogel modified with graphene oxide and sodium montmorillonite and its fire-alarm application	23	198	[31]
32	Malakooti S. (2019)	Low-Cost, Ambient Dried, Superhydrophobic, High Strength, Thermally Insulating and Thermally Resilient Polybenzoxazine Aerogels	23	30	[32]
33	Yang W. (2021)	Design of Intrinsically Flame-Retardant Vanillin-Based Epoxy Resin for Thermal-Conductive Epoxy/Graphene Aerogel Composites	22	16	[33]
34	Liang W. (2019)	Facile preparation of attapulgite-based aerogels with excellent flame retardancy and better thermal insulation properties	21	129	[34]
35	Cao C. (2021)	Thermally induced fire early warning aerogel with efficient thermal isolation and flame-retardant properties	20	148	[35]

36	Zhang D. (2021)	Mechanically strong polyimide aerogels cross-linked with dopamine-functionalized carbon nanotubes for oil absorption	19	100	[36]
37	Hai Y. (2020)	Layer-by-Layer Assembly of Aerogel and Alginate toward Self-Extinguishing Flexible Polyurethane Foam	15	49	[37]
38	Wang L. (2019b)	Superelastic, Anticorrosive, and Flame-Resistant Nitrogen-Containing Resorcinol Formaldehyde/Graphene Oxide Composite Aerogels	15	187	[38]
39	Riahipour R. (2018)	Improving flame-retardant, thermal, and mechanical properties of an epoxy using halogen-free fillers	15	36	[39]
40	Zhang Y. (2022)	Tightly-packed fluorinated graphene aerogel/polydimethylsiloxane composite with excellent thermal management properties	14	3	[40]
41	Wu Z.-H. (2023)	Silane modified MXene/polybenzazole nanocomposite aerogels with exceptional surface hydrophobicity, flame retardance and thermal insulation	11	48	[41]
42	Niu J. (2022)	Experimental study on low thermal conductive and flame retardant phase change composite material for mitigating battery thermal runaway propagation	11	6	[42]
43	Zhao H. (2022)	Lightweight and mechanically robust carbon aerogel/SnO2 nanorods composites with heterogeneous structure for electromagnetic interference shielding	9	14	[43]
44	Dan H. (2022)	Fabrication of superhydrophobic Enteromorpha-derived carbon aerogels via NH4H2PO4 modification for multi-behavioral oil/water separation	9	14	[44]
45	Huang J. (2022a)	High enthalpy efficiency lignin-polyimide porous hybrid aerogel composite phase change material with flame retardancy for superior solar-to-thermal energy conversion and storage	8	10	[45]

46	Luo Z. (2022)	Efficient flame-retardant biomass aerogel endowed with graphene oxide interconnected networks for ultrasensitive fire warning	8	29	[46]
47	Shen R. (2022)	Biomass modified boron nitride/polyimide hybrid aerogel supported phase change composites with superior energy storage capacity and improved flame retardancy for solar-thermal energy storage	7	35	[47]
48	Niu Q. (2022c)	Flame retardant bamboo fiber reinforced polylactic acid composites regulated by interfacial phosphorus-silicon aerogel	7	41	[48]
49	Jia L.J. (2021)	Ultra-light poly(lactic acid)/SiO2 aerogel composite foam: A fully biodegradable and full life-cycle sustainable insulation material	7	12	[49]
50	Liu R. (2021)	Robust Silica–Polyimide Aerogel Blanket for Water-Proof and Flame-Retardant Self-Floating Artificial Island	7	65	[50]
51	Wang L. (2021)	Metal-graphene-synergized melamine aerogel with robust elasticity and flame-retardancy for thermal-insulated-packaging industry	7	198	[51]
52	Zheng X. (2021)	Improvement of Flame Retardancy of Polyurethane Foam Using DOPO-Immobilized Silica Aerogel	6	60	[52]
53	Niu Q. (2022a)	Interfacial silicon?nitrogen aerogel raise flame retardancy of bamboo fiber reinforced polylactic acid composites	5	29	[53]

Table S4: List of the most involved organization involved in the relevant field based on documents

S/N	Organization	Documents	Citations	Mean citations	Total link strength
1	Department of Macromolecular Science and Engineering, Case Western Reserve University, Cleveland, Oh 44106-7202, United States	5	445	89	893
2	Institute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang, 621000, China	5	320	64	739
3	College of Biomass Science and Engineering, Sichuan University, Chengdu, 610065, China	4	78	19.5	105
4	College of Petrochemical Technology, Lanzhou University of Technology, Langongping Road 287, Lanzhou, 730050, China	4	88	22	137
5	Guangdong Provincial Key Laboratory of Functional Soft Condensed Matter, School of Materials and Energy, Guangdong University of Technology, Guangzhou, 510006, China	4	267	66.75	247
6	School of Mechanical and Manufacturing Engineering, University of New South Wales, Sydney, Nsw 2052, Australia	4	219	54.75	759
7	Center for Degradable and Flame-Retardant Polymeric Materials, National Engineering Laboratory of Eco-Friendly Polymeric Materials (Sichuan), State Key Laboratory of Polymer Materials Engineering, College of Chemistry, Sichuan University, Chengdu, 610064, China	3	198	66	556
8	Key Laboratory of Synthetic and Biological Colloids, Ministry of Education, School of Chemical and Material Engineering, Jiangnan University, Wuxi, 214122, China	3	85	28	449

9	Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, 315201, China	3	16	5	259
10	School of Petrochemical Engineering, Changzhou University, Changzhou, 213164, China	3	13	4	329
11	School of Resource and Safety Engineering, Central South University, Changsha, 410083, China	3	41	13.6	703
12	State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, Donghua University, Shanghai, 201620, China	3	154	51.3	384
13	State Key Laboratory of Chemical Engineering, College of Chemical and Biological Engineering, Zhejiang University, Hangzhou, 310027, China	3	154	51.3	215
14	State Key Laboratory of Fire Science, University of Science and Technology of China, 96 Jinzhai Road, Hefei, Anhui 230026, China	3	102	34	366
15	State Key Laboratory of Polymer Materials Engineering, Polymer Research Institute of Sichuan University, Chengdu, 610065, China	3	64	21.3	197
16	Academy of Scientific and Innovative Research (Acsir), Ghaziabad, 201002, India	2	2	1	232
17	Center for Degradable and Flame-Retardant Polymeric Materials, College of Chemistry, National Engineering Laboratory of Eco-Friendly Polymeric Materials (Sichuan), State Key Laboratory of Polymer Materials Engineering, Sichuan University, Chengdu, 610064, China	2	107	53.5	469
18	Civil and Infrastructure Engineering, School of Engineering, Rmit University, Melbourne, 3004, Australia	2	16	8	522
19	College of Chemistry and Materials Engineering, Zhejiang A&F University, Hangzhou, 311300, China	2	21	10.5	16

20	Department of Architecture and Civil Engineering, City University of Hong Kong, 88 Tat Chee Avenue, Kowloon, Hong Kong	2	185	92.5	298
21	Department of Materials and Environmental Chemistry, Stockholm University, Stockholm, 106 91, Sweden	2	1063	531.5	215
22	Department of Polymeric Materials and Engineering, School of Materials and Energy, Guangdong University of Technology, Guangzhou, 510006, China	2	15	7.5	31
23	Faculty of Engineering, China University of Geosciences (Wuhan), Hubei, Wuhan, 430074, China	2	0	0	48
24	Key Laboratory of Bio-Based Material Science and Technology, Ministry of Education, Northeast Forestry University, Harbin, 150040, China	2	9	4.5	81
25	Key Laboratory of Bioelectrochemistry and Environmental Analysis of Gansu Province, Lanzhou, 730070, China	2	31	15.5	0
26	Key Laboratory of Functional Geomaterials in China Nonmetallic Minerals Industry, China University of Geosciences, Wuhan, 430074, China	2	0	0	172
27	Key Laboratory of Rubber-Plastics, Ministry of Education, Shandong Provincial Key Laboratory of Rubber-Plastics, Qingdao University of Science & Technology, Qingdao, 266042, China	2	2	1	211
28	Key Laboratory of Rubber-Plastics, Ministry of Education/Shandong Provincial Key Laboratory of Rubber-Plastics, Qingdao University of Science & Technology, Qingdao City, Shandong 266042, China	2	84	42	284
29	Key Laboratory of Rubber–Plastics, Ministry of Education/Shandong Provincial Key Laboratory of Rubber–Plastics, Qingdao University of Science and Technology, Qingdao, 266042, China	2	9	4.5	11
30	Laboratory of Polymer Materials and Engineering, Ningbotech University, Ningbo, 315100, China	2	11	5.5	194

31	National Engineering Laboratory for Modern Silk, College of Textile and Clothing Engineering, Soochow University, Suzhou, 215123, China	2	148	74	293
32	National Key Laboratory of Science and Technology on Advanced Composites In Special Environments, Harbin Institute Of Technology, Harbin, 150001, China	2	17	8.5	64
33	Postdoctoral Research Station on Mechanics, College of Aerospace Science and Engineering, National University of Defense Technology, Hunan, Changsha, 410073, China	2	3	1.5	26
34	Research Institute of Chemical Defense, Beijing, 102205, China	2	6	3	269
35	School Of Economics and Management, Changsha University, Changsha, 410083, China	2	16	8	522
36	School Of Energy Resources and Safety, Anhui University Of Science and Technology, Huainan, Anhui 232001, China	2	91	45.5	280
37	School of Environmental & Safety Engineering, Changzhou University, Changzhou, 213164, China	2	12	6	256
38	School of Materials Science and Engineering, Nanyang Technological University, 50 Nanyang Avenue, Singapore, 639798, Singapore	2	148	74	293
39	School of Mechanical Engineering, University of Tehran, Tehran, Iran	2	16	8	40
40	School of New Energy and Materials, Southwest Petroleum University, Chengdu, 610500, China	2	1	0.5	123
41	School of Resources Engineering, Xi'an University of Architecture & Technology, Xi'an, 710055, China	2	6	3	269
42	School of Safety Science and Emergency Management, Wuhan University of Technology, Wuhan, China	2	43	21.5	219
43	School of Safety Science and Engineering, Xi'an University of Science & Technology, Xi'an, 710054, China	2	6	3	269
44	School of Science, Xihua University, Chengdu, Sichuan 610039, China	2	62	31	332

45	Shaanxi Province Key Laboratory of Papermaking Technology and Specialty Paper, National Demonstration Center for Experimental Light Chemistry Engineering Education, Shaanxi University of Science and Technology, Shaanxi, Xi'an, 710021, China	2	12	6	194
46	State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, Innovation Center for Textile Science and Technology, Donghua University, 2999 North Renmin Road, Shanghai, 201620, China	2	148	74	283
47	State Key Laboratory of Fire Science, University of Science and Technology of China, Hefei, Anhui 230027, China	2	20	10	384
48	State Key Laboratory of Polymer Materials Engineering, Polymer Research Institute, Sichuan University, Chengdu, 610065, China	2	183	91.5	119
49	The Collaborative Innovation Center for Eco-Friendly and Fire-Safety Polymeric Materials (Moe), National Engineering Laboratory of Eco-Friendly Polymeric Materials (Sichuan), State Key Laboratory of Polymer Materials Engineering, College of Chemistry, Sichuan University, Chengdu, 610064, China	2	99	49.5	297

Table S5: List of the top influential countries based on the number of documents

S/N	Country	Documents	Citations	Mean citations	Total link strength
1	China	194	5932	30.57	16432
2	United States	20	991	49.55	4596
3	Australia	11	461	41.9	4177
4	Canada	9	209	23	2329
5	India	8	165	20.62	1166
6	Sweden	8	1520	190	2341
7	Spain	7	542	77.42	1972
8	France	6	68	11.3	1674
9	South Korea	6	124	20.6	812
10	Singapore	5	180	36	883
11	Germany	4	1215	303.75	1278
12	Hong Kong	4	293	73.25	1438
13	Iran	4	49	12.25	206
14	Italy	4	1136	284	1020
15	United Kingdom	4	56	14	809
16	Poland	3	81	27	32
17	Switzerland	3	198	66	887
18	Viet Nam	3	30	10	485
19	Austria	2	117	58.5	605
20	Czech Republic	2	49	24.5	304
21	Finland	2	95	47.5	712
22	Slovenia	2	990	495	676

Table S6: Full list of the top contributing authors in the relevant field of study.

S/N	Author	Documents	Citations	Mean citations	Total link strength
1	Wang X.	18	687	38.2	11743
2	Zhang X.	15	442	29.5	8044
3	Wang J.	13	239	18.4	10404
4	Zhang L.	13	684	52.6	9613
5	Li Z.	10	142	14.2	8994
6	Wang H.	10	380	38	6501
7	Wang Y.	10	137	13.7	3998
8	Wang L.	9	177	19.7	8852
9	Wang Y.-Z.	9	583	64.8	10727
10	Hu Y.	8	107	13.4	7102
11	Li H.	8	176	22	5815
12	Li X.	8	80	10	5095
13	Li Y.	8	167	20.9	7302
14	Zhang J.	8	169	20.1	5370
15	Zhang Z.	8	159	19.9	4491
16	Chen J.	7	106	15.1	5437
17	Chen Y.	7	281	40.1	3967
18	Shang K.	7	393	56.1	8665
19	Wang Z.	7	60	9	3819
20	Zhang S.	7	34	5	5154
21	Zhao H.-B.	7	451	64.4	6753
22	Chen H.-B.	6	378	63	7448
23	Cheng X.	6	127	21.2	4676
24	Huang J.	6	263	43.8	3459
25	Li A.	6	132	22	5230
26	Li M.	6	332	55.3	5248
27	Liu T.	6	324	54	4618
28	Liu Y.	6	113	18.8	3907
29	Schiraldi D.A.	6	503	83.8	8433
30	Xu J.	6	106	17.7	2444
31	Yang Y.	6	176	29.3	4154
32	Yuan B.	6	220	36.7	4447
33	Zhang Y.	6	196	32.7	4171
34	Zhou X.	6	110	13.3	4667
35	Zhu Z.	6	132	22	5230
36	Chen Z.	5	253	50.6	3124
37	Fan W.	5	302	60.4	4320

38	Huang Y.	5	252	50.4	2652
39	Li J.	5	167	33.4	2498
40	Liang W.	5	109	21.8	3608
41	Liao W.	5	305	61	6445
42	Liu L.	5	129	26	2943
43	Liu X.	5	122	24.4	1695
44	Sheng X.	5	274	55	3434
45	Sun H.	5	109	21.8	3608
46	Yang W.	5	241	48.2	7471
47	Yao C.	5	42	8.4	2635
48	Yue X.	5	17	3.4	2328
49	Zhao J.	5	22	4.4	1891
50	Chen M.-J.	4	284	71	3454
51	Deng S.	4	72	18	1932
52	Du X.	4	89	22.3	840
53	Gao B.	4	22	5.5	1988
54	Guo Z.	4	19	5	1045
55	He J.	4	55	14	2676
56	Li S.	4	214	54	3225
57	Liu C.	4	29	7.3	1535
58	Liu S.	4	109	27.3	2377
59	Lu H.-D.	4	219	55	7175
60	Luo Y.	4	146	37	3616
61	Ma X.	4	64	16	1790
62	Pan Y.	4	81	20.3	3417
63	Shi L.	4	55	14	4315
64	Sánchez-Soto M.	4	112	28	4217
65	Wang F.	4	67	17	2791
66	Wang S.	4	121	30.3	2723
67	Wang Y.-T.	4	299	75	5170
68	Wu L.	4	48	12	4104
69	Wu N.	4	88	22	3943
70	Wu Y.	4	26	7	2905
71	Yu J.	4	141	35.3	2671
72	Yu Z.	4	46	11.5	1414
73	Zhang H.	4	52	13	3593
74	Zhang Q.	4	126	32	2425
75	Zhao Y.	4	63	16	1934
76	Zhu J.	4	96	24	3356

77	Bergström L.	3	1280	427	2404
78	Carosio F.	3	1114	371	1849
79	Chan Q.N.	3	206	69	3699
80	Chen C.	3	3	1	1975
81	Chen L.	3	90	30	1045
82	Chen R.	3	47	16	2002
83	Chen S.	3	45	15	2615
84	Deng J.	3	6	2	1016
85	Deng Y.	3	54	18	3289
86	Du Z.	3	67	22.3	967
87	Fang Z.	3	16	5.3	946
88	Gong L.	3	64	21.3	2853
89	Guo X.	3	2	0.7	2809
90	Han Y.	3	201	67	1187
91	He X.	3	35	11.7	1359
92	Hong C.	3	42	14	1228
93	Hu Z.	3	111	37	1386
94	Huang H.	3	14	4.7	1269
95	Huang W.	3	20	6.7	1515
96	Jiang C.	3	83	28	2714
97	Jiang S.	3	35	12	1438
98	Jiang Y.	3	0	0	1556
99	Jin H.	3	76	25.3	4208
100	Li C.	3	106	35.3	2417
101	Li L.	3	57	19	1489
102	Liu Q.	3	41	14	3651
103	Lu X.	3	38	13	1612
104	Ma Y.	3	52	17.3	2285
105	Mao L.	3	13	4.3	1890
106	Niu F.	3	87	29	2809
107	Niu Q.	3	16	5.3	946
108	Shi H.	3	13	4.3	1117
109	Song L.	3	102	34	2499
110	Song P.	3	356	119	1566
111	Wang C.	3	110	37	2121
112	Wang W.	3	26	9	2092
113	Wu X.	3	183	61	2703
114	Wu Z.	3	42	14	1565
115	Xiao H.	3	82	27.3	2447

116	Xiao Y.	3	7	2.3	1067
117	Xie D.	3	135	45	2074
118	Xu L.	3	105	35	2136
119	Xu T.	3	75	25	4233
120	Xu X.	3	106	35.3	1330
121	Xue T.	3	85	28.3	3066
122	Yan Y.	3	79	26.3	1066
123	Yang F.	3	54	18	2131
124	Yang H.	3	26	9	2903
125	Yang Z.	3	49	16.3	2593
126	Yu B.	3	315	105	3848
127	Yuen A.C.Y.	3	198	66	5957
128	Yun S.	3	76	25.3	4208
129	Zhang C.	3	26	9	1533
130	Zhang W.	3	1	0.3	995
131	Zhao C.	3	54	18	1861
132	Zhou K.	3	130	43.3	2140
133	Zhou Z.	3	26	9	1451
134	Zhu S.-E.	3	206	69	3699
135	Antonietti M.	2	1192	596	1062
136	Apostolopoulou-Kalkavoura V.	2	305	153	1906
137	Baniassadi M.	2	16	8	363
138	Bo G.	2	26	13	834
139	Bourbigot S.	2	1	0.5	2874
140	Cao C.	2	49	25	889
141	Cao K.	2	57	29	1446
142	Cao M.	2	99	50	2675
143	Cao Y.	2	103	51.5	915
144	Chen H.	2	23	11.5	1415
145	Chen M.	2	123	62	1428
146	Chen W.	2	20	10	1003
147	Cheng J.-B.	2	143	72	2070
148	Cui C.	2	20	10	1120
149	Cui H.	2	4	2	1790
150	Cui Y.	2	171	86	936
151	Dai C.	2	52	26	2755
152	Deng X.	2	16	8	2364
153	Ding F.	2	3	1.5	671

154	Ding S.	2	24	12	2210
155	Ding Y.	2	0	0	850
156	Dong X.	2	31	16	1185
157	Fang Y.	2	20	10	370
158	Feng J.	2	4	2	1253
159	Gao W.	2	217	109	1266
160	Gao X.	2	11	6	1375
161	Geng J.	2	77	39	1364
162	Gong K.	2	0	0	759
163	Gong L.-X.	2	57	28.5	1446
164	Gu Y.	2	52	26	2755
165	Guan G.	2	52	26	2755
166	Guo L.	2	105	52.5	1257
167	Guo R.	2	20	10	1120
168	Hu T.	2	75	38	3347
169	Huang D.	2	2	1	2442
170	Huang S.	2	36	18	2471
171	Ji H.	2	3	1.5	671
172	Jia L.	2	2	1	373
173	Jiang F.	2	17	9	1618
174	Jiang H.	2	143	72	1944
175	Jiao Y.	2	82	41	1380
176	Kang A.-H.	2	95	48	2865
177	Lai X.	2	24	12	1209
178	Lai Y.	2	148	74	1587
179	Li B.	2	3	1.5	1695
180	Li D.	2	4	2	1750
181	Li K.	2	4	2	613
182	Li W.	2	32	16	1210
183	Li X.-L.	2	62	31	1782
184	Liang C.	2	299	150	299
185	Liao J.	2	33	17	792
186	Lin J.	2	30	15	575
187	Liu M.	2	131	66	2270
188	Liu P.	2	61	31	1687
189	Lu C.	2	192	96	831
190	Lu M.	2	31	16	229
191	Luo X.	2	65	33	1123
192	Ma C.	2	88	44	1644

193	Ma D.	2	46	23	1655
194	Mao Z.	2	74	37	1800
195	Mei Y.	2	135	68	1603
196	Mi Q.	2	108	54	1919
197	Nabipour H.	2	91	46	1666
198	Nie S.	2	91	46	1666
199	Niu H.	2	22	11	967
200	Niu M.	2	3	1.5	609
201	Niu Y.	2	16	8	1301
202	Ouyang C.	2	2	1	2442
203	Pan H.	2	130	65	2292
204	Ping P.	2	44	22	2852
205	Qian X.	2	57	29	1312
206	Qiang X.	2	2	1	2442
207	Qin R.	2	3	1.5	609
208	Qing Y.	2	38	19	785
209	Que Y.	2	1	0.5	1625
210	Ren E.	2	20	10	1120
211	Ren X.	2	16	8	1074
212	Riahipour R.	2	16	8	363
213	Shen J.	2	78	39	1112
214	Shen P.	2	152	76	1811
215	Shi J.	2	27	14	339
216	Shi S.	2	17	9	633
217	Shi Y.	2	11	6	638
218	Si J.-Y.	2	185	93	2475
219	Song R.	2	108	54	1919
220	Su M.	2	16	8	1301
221	Sui X.	2	74	37	1800
222	Sun G.	2	89	45	1593
223	Sun J.	2	32	16	2931
224	Sun Q.	2	43	22	1270
225	Tang L.-C.	2	57	29	1446
226	Tehrani M.	2	16	8	363
227	Tian J.	2	34	17	1787
228	Tian X.	2	26	13	834
229	Wang B.	2	0	0	1463
230	Wang L.-L.	2	44	22	2852
231	Wang M.	2	1	0.5	1819

232	Wang N.-N.	2	183	92	2083
233	Wang Q.	2	31	16	542
234	Wang R.	2	42	21	1594
235	Wei J.	2	1	0.5	1625
236	Weng M.	2	104	52	765
237	Wu H.	2	122	61	1122
238	Wu J.	2	26	13	834
239	Wu Q.	2	0	0	783
240	Wu S.	2	36	18	1274
241	Xia M.	2	53	27	2866
242	Xia Y.	2	16	8	1153
243	Xiang D.	2	1	0.5	1625
244	Xie H.	2	89	45	1344
245	Xie W.	2	89	45	1826
246	Xing Y.	2	81	41	930
247	Xu G.	2	3	1.5	671
248	Xu K.	2	0	0	1429
249	Xu Y.	2	1	0.5	1437
250	Xue B.	2	3	1.5	609
251	Yan M.	2	50	25	2189
252	Yang D.	2	0	0	1277
253	Yang L.	2	81	41	864
254	Yang M.	2	0	0	740
255	Ye D.-D.	2	95	48	2865
256	Yeoh G.-H.	2	183	92	2083
257	Yeoh G.H.	2	36	18	5116
258	Yin L.	2	0	0	759
259	Yu P.	2	10	5	1161
260	Yu Y.	2	13	7	1419
261	Zhang A.-N.	2	143	72	2070
262	Zhang G.-D.	2	57	29	1446
263	Zhang M.	2	7	4	622
264	Zhang T.	2	37	19	1730
265	Zhao H.	2	9	5	1549
266	Zhao X.	2	51	26	2540
267	Zhong Y.	2	6	3	938
268	Zhou J.	2	0	0	850
269	Zhu G.	2	0	0	578
270	Zhu Y.	2	40	20	2212

Table S7: World Collaboration Map of Country Involvements "From" and "To"

S/N	From	To	Frequency
1	Australia	France	1
2	Australia	Hong Kong	2
3	Canada	Finland	1
4	Canada	Sweden	2
5	Canada	Switzerland	2
6	China	Australia	11
7	China	Canada	6
8	China	France	3
9	China	Germany	2
10	China	Hong Kong	4
11	China	Italy	1
12	China	Japan	1
13	China	Korea	1
14	China	New Zealand	1
15	China	Saudi Arabia	1
16	China	Singapore	3
17	China	Spain	4
18	China	Sweden	3
19	China	Switzerland	2
20	China	United Kingdom	4
21	China	USA	12
22	Finland	Switzerland	1
23	India	Brazil	1
24	India	France	1
25	India	Germany	1

References

1. Wicklein, B.; Kocjan, A.; Salazar-Alvarez, G.; Carosio, F.; Camino, G.; Antonietti, M.; Bergström, L. Thermally insulating and fire-retardant lightweight anisotropic foams based on nanocellulose and graphene oxide. *Nature Nanotechnology* **2015**, *10*, 277-283, doi:10.1038/nnano.2014.248.
2. Liang, C.; Qiu, H.; Song, P.; Shi, X.; Kong, J.; Gu, J. Ultra-light MXene aerogel/wood-derived porous carbon composites with wall-like "mortar/brick" structures for electromagnetic interference shielding. *Science Bulletin* **2020**, *65*, 616-622, doi:https://doi.org/10.1016/j.scib.2020.02.009.

3. Wang, N.-N.; Wang, H.; Wang, Y.-Y.; Wei, Y.-H.; Si, J.-Y.; Yuen, A.C.Y.; Xie, J.-S.; Yu, B.; Zhu, S.-E.; Lu, H.-D., et al. Robust, Lightweight, Hydrophobic, and Fire-Retarded Polyimide/MXene Aerogels for Effective Oil/Water Separation. *ACS Applied Materials & Interfaces* **2019**, *11*, 40512-40523, doi:10.1021/acsami.9b14265.
4. Wang, D.; Peng, H.; Yu, B.; Zhou, K.; Pan, H.; Zhang, L.; Li, M.; Liu, M.; Tian, A.; Fu, S. Biomimetic structural cellulose nanofiber aerogels with exceptional mechanical, flame-retardant and thermal-insulating properties. *Chemical Engineering Journal* **2020**, *389*, 124449, doi:https://doi.org/10.1016/j.cej.2020.124449.
5. Luo, Y.; Xie, Y.; Jiang, H.; Chen, Y.; Zhang, L.; Sheng, X.; Xie, D.; Wu, H.; Mei, Y. Flame-retardant and form-stable phase change composites based on MXene with high thermostability and thermal conductivity for thermal energy storage. *Chemical Engineering Journal* **2021**, *420*, 130466, doi:https://doi.org/10.1016/j.cej.2021.130466.
6. He, C.; Huang, J.; Li, S.; Meng, K.; Zhang, L.; Chen, Z.; Lai, Y. Mechanically Resistant and Sustainable Cellulose-Based Composite Aerogels with Excellent Flame Retardant, Sound-Absorption, and Superantiwetting Ability for Advanced Engineering Materials. *ACS Sustainable Chemistry & Engineering* **2018**, *6*, 927-936, doi:10.1021/acssuschemeng.7b03281.
7. Maleki, H.; Montes, S.; Hayati-Roodbari, N.; Putz, F.; Huesing, N. Compressible, Thermally Insulating, and Fire Retardant Aerogels through Self-Assembling Silk Fibroin Biopolymers Inside a Silica Structure—An Approach towards 3D Printing of Aerogels. *ACS Applied Materials & Interfaces* **2018**, *10*, 22718-22730, doi:10.1021/acsami.8b05856.
8. Wang, Y.; Cui, Y.; Shao, Z.; Gao, W.; Fan, W.; Liu, T.; Bai, H. Multifunctional polyimide aerogel textile inspired by polar bear hair for thermoregulation in extreme environments. *Chemical Engineering Journal* **2020**, *390*, 124623, doi:https://doi.org/10.1016/j.cej.2020.124623.
9. Cao, Y.; Weng, M.; Mahmoud, M.H.H.; Elnaggar, A.Y.; Zhang, L.; El Azab, I.H.; Chen, Y.; Huang, M.; Huang, J.; Sheng, X. Flame-retardant and leakage-proof phase change composites based on MXene/polyimide aerogels toward solar thermal energy harvesting. *Advanced Composites and Hybrid Materials* **2022**, *5*, 1253-1267, doi:10.1007/s42114-022-00504-4.
10. Pirzada, T.; Ashrafi, Z.; Xie, W.; Khan, S. Cellulose Silica Hybrid Nanofiber Aerogels: From Sol-Gel Electrospun Nanofibers to Multifunctional Aerogels. *Advanced Functional Materials* **2020**, *30*, 1907359, doi:10.1002/adfm.201907359.
11. Zhang, Q.; Lin, D.; Deng, B.; Xu, X.; Nian, Q.; Jin, S.; Leedy, K.; Li, H.; Cheng, G. Flyweight, Superelastic, Electrically Conductive, and Flame-Retardant 3D Multi-Nanolayer Graphene/Ceramic Metamaterial. *Advanced Materials* **2017**, *29*, doi:10.1002/adma.201605506.
12. Kang, W.; Cui, Y.; Qin, L.; Yang, Y.; Zhao, Z.; Wang, X.; Liu, X. A novel robust adsorbent for efficient oil/water separation: Magnetic carbon nanospheres/graphene composite aerogel. *Journal of Hazardous Materials* **2020**, *392*, 122499, doi:https://doi.org/10.1016/j.jhazmat.2020.122499.
13. Carosio, F.; Maddalena, L.; Gómez, J.; Saracco, G.; Fina, A. Graphene Oxide Exoskeleton to Produce Self-Extinguishing, Nonignitable, and Flame Resistant Flexible Foams: A

Mechanically Tough Alternative to Inorganic Aerogels. *Advanced Materials Interfaces* **2018**, *5*, doi:10.1002/admi.201801288.
14. Ahmed, A.; El-Kady, M.F.; Hassan, I.; Negm, A.; Pourrahimi, A.M.; Muni, M.; Selvaganapathy, P.R.; Kaner, R.B. Fire-retardant, self-extinguishing triboelectric nanogenerators. *Nano Energy* **2019**, *59*, 336-345, doi:https://doi.org/10.1016/j.nanoen.2019.02.026.
15. Zhang, Z.-H.; Chen, Z.-Y.; Tang, Y.-H.; Li, Y.-T.; Ma, D.; Zhang, G.-D.; Boukherroub, R.; Cao, C.-F.; Gong, L.-X.; Song, P., et al. Silicone/graphene oxide co-cross-linked aerogels with wide-temperature mechanical flexibility, super-hydrophobicity and flame resistance for exceptional thermal insulation and oil/water separation. *Journal of Materials Science & Technology* **2022**, *114*, 131-142, doi:https://doi.org/10.1016/j.jmst.2021.11.012.
16. Zhao, K.; Huang, J.; Mao, J.; Bao, Z.; Chen, Z.; Lai, Y. Charged graphene aerogel filter enabled superior particulate matter removal efficiency in harsh environment. *Chemical Engineering Journal* **2020**, *395*, 125086, doi:https://doi.org/10.1016/j.cej.2020.125086.
17. Sheng; Li, Z.; Zhao; Zhai; Zhang, Y.; Lu, S. Synergistic Effects of Two-Dimensional MXene and Ammonium Polyphosphate on Enhancing the Fire Safety of Polyvinyl Alcohol Composite Aerogels. *Polymers* **2019**, *11*, 1964, doi:10.3390/polym11121964.
18. Lee, H.; Lee, D.; Cho, J.; Kim, Y.-O.; Lim, S.; Youn, S.; Jung, Y.C.; Kim, S.Y.; Seong, D.G. Super-insulating, flame-retardant, and flexible poly(dimethylsiloxane) composites based on silica aerogel. *Composites Part A: Applied Science and Manufacturing* **2019**, *123*, 108-113, doi:https://doi.org/10.1016/j.compositesa.2019.05.004.
19. Sun, J.; Wu, Z.; An, B.; Ma, C.; Xu, L.; Zhang, Z.; Luo, S.; Li, W.; Liu, S. Thermal-insulating, flame-retardant and mechanically resistant aerogel based on bio-inspired tubular cellulose. *Composites Part B: Engineering* **2021**, *220*, 108997, doi:https://doi.org/10.1016/j.compositesb.2021.108997.
20. Du, Y.; Xu, J.; Fang, J.; Zhang, Y.; Liu, X.; Zuo, P.; Zhuang, Q. Ultralight, highly compressible, thermally stable MXene/aramid nanofiber anisotropic aerogels for electromagnetic interference shielding. *Journal of Materials Chemistry A* **2022**, *10*, 6690-6700, doi:10.1039/D1TA11025J.
21. Zhang, Z.; Wang, X.; Zu, G.; Kanamori, K.; Nakanishi, K.; Shen, J. Resilient, fire-retardant and mechanically strong polyimide-polyvinylpolymethylsiloxane composite aerogel prepared via stepwise chemical liquid deposition. *Materials & Design* **2019**, *183*, 108096, doi:https://doi.org/10.1016/j.matdes.2019.108096.
22. Qian, Z.; Li, R.; Guo, J.; Wang, Z.; Li, X.; Li, C.; Zhao, N.; Xu, J. Triboelectric nanogenerators made of polybenzazole aerogels as fire-resistant negative tribo-materials. *Nano Energy* **2019**, *64*, 103900, doi:https://doi.org/10.1016/j.nanoen.2019.103900.
23. Motahari, S.; Motlagh, G.H.; Moharramzadeh, A. Thermal and Flammability Properties of Polypropylene/Silica Aerogel Composites. *Journal of Macromolecular Science, Part B* **2015**, *54*, 1081-1091, doi:10.1080/00222348.2015.1078619.
24. Tian, J.; Yang, Y.; Xue, T.; Chao, G.; Fan, W.; Liu, T. Highly flexible and compressible polyimide/silica aerogels with integrated double network for thermal insulation and fire-retardancy. *Journal of Materials Science & Technology* **2022**, *105*, 194-202.

25. Le, D.K.; Leung, R.I.H.; Er, A.S.R.; Zhang, X.; Tay, X.J.; Thai, Q.B.; Phan-Thien, N.; Duong, H.M. Applications of functionalized polyethylene terephthalate aerogels from plastic bottle waste. *Waste Management* **2019**, *100*, 296-305, doi:https://doi.org/10.1016/j.wasman.2019.09.031.
26. Yang, Y.; Lyu, J.; Chen, J.; Liao, J.; Zhang, X.J.A.F.M. Flame-Retardant Host–Guest Films for Efficient Thermal Management of Cryogenic Devices. **2021**, *31*, 2102232.
27. Chen, F.; Zhang, J.; Li, N.; Zhang, C.; Ji, B.; Hu, L.; Zhao, T.; Wang, Z.; Zhang, S. Heat insulating, fire retardant and flexible inorganic nanocomposite paper. *Materials & Design* **2018**, *144*, 281-289, doi:https://doi.org/10.1016/j.matdes.2018.02.039.
28. Li, Z.; Huang, S.; Shi, L.; Li, Z.; Liu, Q.; Li, M. Reducing the flammability of hydrophobic silica aerogels by doping with hydroxides. *Journal of Hazardous Materials* **2019**, *373*, 536-546, doi:https://doi.org/10.1016/j.jhazmat.2019.03.112.
29. Cheng, H.; Hong, C.; Zhang, X.; Xue, H.; Meng, S.; Han, J. Super flame-retardant lightweight rime-like carbon-phenolic nanofoam. *Scientific Reports* **2016**, *6*, 33480, doi:10.1038/srep33480.
30. Shu, R.; Xu, J.; Nie, L.; Shi, J. Facile construction of three-dimensional porous netlike reduced graphene oxide/zinc oxide composite aerogels as the lightweight, flame retardant, compression resilience and high-performance electromagnetic wave absorbers. *Composites Part A: Applied Science and Manufacturing* **2022**, *160*, 107068, doi:https://doi.org/10.1016/j.compositesa.2022.107068.
31. Zuo, B.; Yuan, B.J.P.f.A.T. Flame-retardant cellulose nanofiber aerogel modified with graphene oxide and sodium montmorillonite and its fire-alarm application. **2021**, *32*, 1877-1887.
32. Malakooti, S.; Qin, G.; Mandal, C.; Soni, R.; Taghvaee, T.; Ren, Y.; Chen, H.; Tsao, N.; Shiao, J.; Kulkarni, S.S., et al. Low-Cost, Ambient-Dried, Superhydrophobic, High Strength, Thermally Insulating, and Thermally Resilient Polybenzoxazine Aerogels. *ACS Applied Polymer Materials* **2019**, *1*, 2322-2333, doi:10.1021/acsapm.9b00408.
33. Yang, W.; Ding, H.; Liu, T.; Ou, R.; Lin, J.; Puglia, D.; Xu, P.; Wang, Q.; Dong, W.; Du, M., et al. Design of Intrinsically Flame-Retardant Vanillin-Based Epoxy Resin for Thermal-Conductive Epoxy/Graphene Aerogel Composites. *ACS Applied Materials & Interfaces* **2021**, *13*, 59341-59351, doi:10.1021/acsami.1c19727.
34. Liang, W.; Wang, R.; Wang, C.; Jia, J.; Sun, H.; Zhang, J.; Yang, Y.; Zhu, Z.; Li, A.J.J.o.A.P.S. Facile preparation of attapulgite-based aerogels with excellent flame retardancy and better thermal insulation properties. **2019**, *136*, 47849.
35. Cao, C.; Yuan, B.J.P.f.A.T. Thermally induced fire early warning aerogel with efficient thermal isolation and flame-retardant properties. **2021**, *32*, 2159-2168.
36. Zhang, D.; Lin, Y.; Wang, W.; Li, Y.; Wu, G. Mechanically strong polyimide aerogels cross-linked with dopamine-functionalized carbon nanotubes for oil absorption. *Applied Surface Science* **2021**, *543*, 148833, doi:https://doi.org/10.1016/j.apsusc.2020.148833.
37. Hai, Y.; Wang, C.; Jiang, S.; Liu, X. Layer-by-Layer Assembly of Aerogel and Alginate toward Self-Extinguishing Flexible Polyurethane Foam. *Industrial & Engineering Chemistry Research* **2020**, *59*, 475-483, doi:10.1021/acs.iecr.9b05590.

38. Wang, L.; Wang, J.; Zheng, L.; Li, Z.; Wu, L.; Wang, X. Superelastic, Anticorrosive, and Flame-Resistant Nitrogen-Containing Resorcinol Formaldehyde/Graphene Oxide Composite Aerogels. *ACS Sustainable Chemistry & Engineering* **2019**, *7*, 10873-10879, doi:10.1021/acssuschemeng.9b01735.
39. Riahipour, R.; Alizadeh Sahraei, A.; van de Werken, N.; Tehrani, M.; Abrinia, K.; Baniassadi, M. Improving flame-retardant, thermal, and mechanical properties of an epoxy using halogen-free fillers. *Science and Engineering of Composite Materials* **2017**, *25*, doi:10.1515/secm-2017-0131.
40. Zhang, Y.; Li, Y.; Lei, Q.; Fang, X.; Xie, H.; Yu, W. Tightly-packed fluorinated graphene aerogel/polydimethylsiloxane composite with excellent thermal management properties. *Composites Science and Technology* **2022**, *220*, 109302, doi:https://doi.org/10.1016/j.compscitech.2022.109302.
41. Wu, Z.-H.; Feng, X.-L.; Qu, Y.-X.; Gong, L.-X.; Cao, K.; Zhang, G.-D.; Shi, Y.; Gao, J.-F.; Song, P.; Tang, L.-C. Silane modified MXene/polybenzazole nanocomposite aerogels with exceptional surface hydrophobicity, flame retardance and thermal insulation. *Composites Communications* **2023**, *37*, 101402, doi:https://doi.org/10.1016/j.coco.2022.101402.
42. Niu, J.; Deng, S.; Gao, X.; Niu, H.; Fang, Y.; Zhang, Z. Experimental study on low thermal conductive and flame retardant phase change composite material for mitigating battery thermal runaway propagation. *Journal of Energy Storage* **2022**, *47*, 103557, doi:https://doi.org/10.1016/j.est.2021.103557.
43. Zhao, H.; Huang, Y.; Wang, X.; Han, Y.; Du, Z.; Zheng, Y.; Chen, L.; Jin, L. Lightweight and mechanically robust carbon aerogel/SnO2 nanorods composites with heterogeneous structure for electromagnetic interference shielding. *Composites Part A: Applied Science and Manufacturing* **2022**, *161*, 107077, doi:https://doi.org/10.1016/j.compositesa.2022.107077.
44. Dan, H.; Ji, K.; Gao, Y.; Yin, W.; Gao, B.; Yue, Q. Fabrication of superhydrophobic Enteromorpha-derived carbon aerogels via NH4H2PO4 modification for multi-behavioral oil/water separation. *Science of The Total Environment* **2022**, *837*, 155869, doi:https://doi.org/10.1016/j.scitotenv.2022.155869.
45. Huang, J.; Su, J.; Xu, W.; Lin, J.; Weng, M.; Liu, Y.; Min, Y.J.S.E.M.; Cells, S. High enthalpy efficiency lignin-polyimide porous hybrid aerogel composite phase change material with flame retardancy for superior solar-to-thermal energy conversion and storage. **2022**, *248*, 112036.
46. Luo, Z.; Ning, H.; Zhou, X.; Yuan, B. Efficient flame-retardant biomass aerogel endowed with graphene oxide interconnected networks for ultrasensitive fire warning. *Materials Letters* **2022**, *318*, 132237, doi:https://doi.org/10.1016/j.matlet.2022.132237.
47. Shen, R.; Liu, L.; Cao, Y.; Zhang, L.; Sheng, X.; Chen, Y. Biomass modified boron nitride/polyimide hybrid aerogel supported phase change composites with superior energy storage capacity and improved flame retardancy for solar-thermal energy storage. *Solar Energy* **2022**, *242*, 287-297, doi:https://doi.org/10.1016/j.solener.2022.07.036.

48. Niu, Q.; Yue, X.; Guo, Z.; Yan, H.; Fang, Z.; Li, J.J.P. Flame retardant bamboo fiber reinforced polylactic acid composites regulated by interfacial phosphorus-silicon aerogel. **2022**, *252*, 124961.
49. Jia, L.J.; Phule, A.D.; Yu, Z.; Zhang, X.; Zhang, Z.X.J.I.J.o.B.M. Ultra-light poly (lactic acid)/SiO2 aerogel composite foam: A fully biodegradable and full life-cycle sustainable insulation material. **2021**, *192*, 1029-1039.
50. Luo, X.; Shen, J.; Ma, Y.; Liu, L.; Meng, R.; Yao, J. Robust, sustainable cellulose composite aerogels with outstanding flame retardancy and thermal insulation. *Carbohydrate Polymers* **2019**, *230*, 115623, doi:10.1016/j.carbpol.2019.115623.
51. Wang, L.; Wang, J.; Wu, L.; Wang, X. Metal-graphene-synergized melamine aerogel with robust elasticity and flame-retardancy for thermal-insulated-packaging industry. *Composites Part A: Applied Science and Manufacturing* **2021**, *140*, 106195, doi:https://doi.org/10.1016/j.compositesa.2020.106195.
52. Zheng, X.g.; Dong, Q.; Wang, X.; Yu, P.; Wang, W.; Zhang, J.; Ren, L.J.F.i.M. Improvement of flame retardancy of polyurethane foam using DOPO-immobilized silica aerogel. **2021**, *8*, 673906.
53. Niu, Q.; Yue, X.; Cao, W.; Guo, Z.; Fang, Z.; Chen, P.; Li, J.J.I.J.o.B.M. Interfacial silicon-nitrogen aerogel raise flame retardancy of bamboo fiber reinforced polylactic acid composites. **2022**, *222*, 2697-2708.