

Dr Han Zhang

MEng, PhD, PGCAP, FHEA, CEng, CSci, MIMMM

School of Engineering and Materials Science
Queen Mary University of London
Mile End Road
London E1 4NS

tel: +44 (0)20 7882 2726

email: han.zhang@qmul.ac.uk web: www.sems.qmul.ac.uk/han.zhang

2021

Highly stretchable and sensitive self-powered sensors based on the N-Type thermoelectric effect of polyurethane/Nax(Ni-ett)n/graphene oxide composites.

Wan K, Liu Z, Schroeder BC, Chen G, Santagiuliana G, Papageorgiou DG, Zhang H and Bilotti E. *Composites Communications* vol. 28,.

Multifunctional epoxy nanocomposites reinforced by two-dimensional materials: A review.

Dong M, Zhang H, Tzounis L, Santagiuliana G, Bilotti E and Papageorgiou DG. *Carbon* vol. 185, 57-81.

Best of Both Worlds: Synergistically Derived Material Properties via Additive Manufacturing of Nanocomposites (Adv. Funct. Mater. 46/2021).

Carrola M, Asadi A, Zhang H, Papageorgiou DG, Bilotti E and Koerner H. *Advanced Functional Materials* vol. 31, (46).

Effects of ultrasonication on the microstructures and mechanical properties of carbon nanotube films and their based composites.

Zhang X, Jiang X, Qu S, Zhang H, Yang W and Lu W. *Composites Science and Technology* 109136-109136.Elsevier.

Best of Both Worlds: Synergistically Derived Material Properties via Additive Manufacturing of Nanocomposites.

Carrola M, Asadi A, Zhang H, Papageorgiou DG, Bilotti E and Koerner H. *Advanced Functional Materials* vol. 31, (46).

Micro-end-milling of carbon nanotube reinforced epoxy nanocomposites manufactured using three roll mill technique.

Le B, Kernin A, Khaliq J, Fu G, Huo D, Bilotti E, Zhang H and Shyha I. *Journal of Manufacturing Processes* vol. 70, 307-320.

Recent progress in acoustic materials and noise control strategies - A review.

Tao Y, Ren M, Zhang H and Peijs T. *Applied Materials Today* vol. 24,.

Nature inspired hierarchical structures in nano-cellular epoxy/graphene-Fe₃O₄ nanocomposites with ultra-efficient EMI and robust mechanical strength.

Fan X, Wang F, Gao Q, Zhang Y, Huang F, Xiao R, Qin J, Zhang H, Shi X and Zhang G. *Journal of Materials Science and Technology*.Elsevier.

Microcellular epoxy/graphene nanocomposites with outstanding electromagnetic interference shielding and mechanical performance by overcoming nanofiller loading/dispersion dichotomy.

Fan X, Gao Q, Gao Y, Zhang G, Huang F, Xiao R, Liu W, Wang F, Qin J, Bilotti E, Zhang H, Shi X and Zhang G. *Composites Science and Technology* 109000-109000.

Self-powered ultrasensitive and highly stretchable temperature-strain sensing composite yarns.

Wan K, Liu Y, Santagiuliana G, Barandun G, Taroni Junior P, Güder F, Bastiaansen CWM, Baxendale M, Fenwick O, Papageorgiou DG, Krause S, Zhang H and Bilotti E. *Materials Horizons*.

Enhancing the reinforcing efficiency in CNT nanocomposites via the development of pyrene-based active dispersants.

Yin X, Li Q, Wang H, Yang W, Zhou X, Zhang H and Lyu W. *Rsc Advances* vol. 11, (39) 23892-23900.

In-situ deposition of diamond on functionally graded copper scaffold for improved thermal conductivity and mechanical properties.

Cheng K, Xiong W, Li Y, Tang D, Geng H, Sun M, Hao L, Wang HS and Zhang H. *Materials Letters* vol. 299,.

Polymer Nanocomposites for Temperature Sensing and Self-regulating Heating Devices.

Liu Y, Zhang H and Bilotti E. *Polymer Nanocomposite Materials*.

P-N junction-based ZnO wearable textile nanogenerator for biomechanical energy harvesting.

He Q, Li X, Zhang J, Zhang H and Briscoe J. *Nano Energy* vol. 85,.

Tailoring nanofibrillated cellulose through sonication and its potential use in molded pulp packaging.

Klayya S, Tawichai N, Intatha U, Zhang H, Bilotti E and Soykeabkaew N. *Nanocomposites* vol. 7, (1) 109-122.

2020

Multiscale understanding of electric polarization in poly(vinylidene fluoride)-based ferroelectric polymers.

Meng N, Ren X, Zhu X, Wu J, Yang B, Gao F, Zhang H, Liao Y, Bilotti E, Reece MJ and Yan H. *Journal of Materials Chemistry C. Royal Society of Chemistry*.

Influence of polylactide (PLA) stereocomplexation on the microstructure of pla/pbs blends and the cell morphology of their microcellular foams.

Sun Z, Wang L, Zhou J, Fan X, Xie H, Zhang H, Zhang G and Shi X. *Polymers* vol. 12, (10) 1-15. *Mdpi Ag*.

The effect of conductive network on positive temperature coefficient behaviour in conductive polymer composites.

Liu Y, Asare E, Porwal H, Barbieri E, Goutianos S, Evans J, Newton M, Busfield JJC, Peijs T, Zhang H and Bilotti E. *Composites Part a: Applied Science and Manufacturing* vol. 139, Elsevier.

Photo-thermal actuation of ultra-drawn high-density polyethylene.

Bhatti MRA, Bilotti E, Zhang H, Bastiaansen CWM and Peijs T. *Polymer* vol. 207, Elsevier.

Ultra-High Actuation Stress Polymer Actuators as Light-Driven Artificial Muscles.

Bhatti MRA, Bilotti E, Zhang H, Varghese S, Verpaalen RCP, Schenning APHJ, Bastiaansen CWM and Peijs T. *Acs Applied Materials & Interfaces* vol. 12, (29) 33210-33218.

A Review on Functionally Graded Materials and Structures via Additive Manufacturing: From Multi-Scale Design to Versatile Functional Properties.

Li Y, Feng Z, Hao L, Huang L, Xin C, Wang Y, Bilotti E, Essa K, Zhang H, Li Z, Yan F and Peijs T. *Advanced Materials Technologies* vol. 5, (6).

High-Performance Transparent Laminates Based on Highly Oriented Polyethylene Films.

Lin Y, Cao J, Zhu M, Bilotti E, Zhang H, Bastiaansen CWM and Peijs T. *Acs Applied Polymer Materials* vol. 2, (6) 2458-2468. *American Chemical Society*.

Giant energy storage density in PVDF with internal stress engineered polar nanostructures.

Ren X, Meng N, Zhang H, Wu J, Abrahams I, Yan H, Bilotti E and Reece MJ. *Nano Energy* vol. 72, Elsevier.

Sustainable and self-regulating out-of-oven manufacturing of FRPs with integrated multifunctional capabilities.

Liu Y, van Vliet T, Tao Y, Busfield JJC, Peijs T, Bilotti E and Zhang H. *Composites Science and Technology* vol. 190, Elsevier.

High-modulus rotary jet spun co-polyimide nanofibers and their composites.

Rogalski JJ, Zhang H, Yao J, Bastiaansen CWM and Peijs T. *Nanocomposites* vol. 6, (1) 1-11.

Chapter 9 Multifunctional composites based on hierarchical micro-nanostructures: design, manufacturing, properties, and applications.

Zhang H and Peijs T. *Fiber-Reinforced Nanocomposites: Fundamentals and Applications*.

Dual in-situ water diffusion monitoring of gfrps based on optical fibres and cnts.

Bellot CM, de Leo G, Zhang H, Kernin A, Scarponi C, Sangermano M, Olivero M, Bilotti E and Salvo M. *Journal of Composites Science* vol. 4, (3).

2019

Ultrahigh β -phase content poly(vinylidene fluoride) with relaxor-like ferroelectricity for high energy density capacitors.

Meng N, Ren X, Santagiuliana G, Ventura L, Zhang H, Wu J, Yan H, Reece MJ and Bilotti E. *Nature Communications* vol. 10, (1).

Flexible and Stretchable Self-Powered Multi-Sensors Based on the N-Type Thermoelectric Response of Polyurethane/Na_x(Ni-ett)_n Composites.

Wan K, Taroni PJ, Liu Z, Liu Y, Tu Y, Santagiuliana G, Hsia I, Zhang H, Fenwick O, Krause S, Baxendale M, Schroeder BC and Bilotti E. *Advanced Electronic Materials* 1900582-1900582. Wiley.

Additive manufacturing high performance graphene-based composites: A review.

Li Y, Feng Z, Huang L, Essa K, Bilotti E, Zhang H, Peijs T and Hao L. *Composites Part a: Applied Science and Manufacturing* vol. 124,.

Transparent, Lightweight, and High Strength Polyethylene Films by a Scalable Continuous Extrusion and Solid-State Drawing Process.

Lin Y, Tu W, Verpaalen RCP, Zhang H, Bastiaansen CWM and Peijs T. *Macromolecular Materials and Engineering*.

Fabrication of Graphene-Reinforced Nanocomposites with Improved Fracture Toughness in Net Shape for Complex 3D Structures via Digital Light Processing.

Feng Z, Li Y, Xin C, Tang D, Xiong W and Zhang H. *Journal of Carbon Research* vol. 5, (2).

Glass-like transparent high strength polyethylene films by tuning drawing temperature.

LIN Y, Patel R, CAO J, TU W, ZHANG H, BILOTTI E, BASTIAANSEN C and PEIJS AA. *Polymer* vol. 171, 180-191. Elsevier.

Tissue-Engineered Trachea Consisting of Electrospun Patterned sc-PLA/GO-g-IL Fibrous Membranes with Antibacterial Property and 3D-Printed Skeletons with Elasticity.

Kang Y, Chaoli W, Youbei Q, Junwei G, ZHANG H, Ton P, Jie K, Guangchang Z and Xuetao S. *Biomacromolecules. American Chemical Society*.

2018

The effect of graphene network formation on the electrical, mechanical, and multifunctional properties of graphene/epoxy nanocomposites.

KERNIN A, WAN K, LIU Y, kong J, shi X, BILOTTI E, Peijs T and ZHANG H. *Composites Science and Technology* vol. 169, 224-231. Elsevier.

Pyroresistivity in Conductive Polymer Composites: A Perspective on Recent Advances and New Applications.

BILOTTI E, LIU Y, ZHANG H, PORWAL H, BUSFIELD J and PEIJS AA. *Polymer International*. Wiley.

Breaking the Nanoparticle Loading-Dispersion Dichotomy in Polymer Nanocomposites with the Art of Croissant-Making.

Santagiuliana G, Picot OT, Crespo M, Porwal H, Zhang H, Li Y, Rubini L, Colonna S, Fina A, Barbieri E, Spoelstra AB, Mirabello G, Patterson JP, Botto L, Pugno NM, Peijs T and Bilotti E. *Acs Nano*.

Smart cord-rubber composites with integrated sensing capabilities by localised carbon nanotubes using a simple swelling and infusion method.

Tao Y, Liu Y, Zhang H, Stevens CA, Bilotti E, Peijs T and Busfield JJC. *Composites Science and Technology* vol. 167, 24-31.

High temperature self-healing SiBCN ceramics derived from hyperbranched polyborosilazanes.

Liu F, Kong J, Luo C, Ye F, Luan X, Tian N, Liu Y, Zhang H, Gu J and Tang Y. *Advanced Composites and Hybrid Materials*.

Tailored pyroresistive performance and flexibility by introducing a secondary thermoplastic elastomeric phase into graphene nanoplatelet (GNP) filled polymer composites for self-regulating heating devices.

Liu Y, Zhang H, Porwal H, Tu W, Wan K, Evans J, Newton M, Busfield JJC, Peijs T and Bilotti E. *Journal of Materials Chemistry C* vol. 6, (11) 2760-2768.

Synergistic Effects of Spray-Coated Hybrid Carbon Nanoparticles for Enhanced Electrical and Thermal Surface Conductivity of CFRP Laminates.

Li Y, Zhang H, Liu Y, WANG HS, Huang Z, Peijs T and Bilotti E. *Composites Part a: Applied Science and Manufacturing*.

2017

Toward Stretchable Self-Powered Sensors Based on the Thermoelectric Response of PEDOT:PSS/Polyurethane Blends.

Taroni PJ, SANTAGIULIANA G, WAN K, Calado P, QIU M, ZHANG H, PUGNO N, PALMA M, Stingelin-Stutzmann N, Heeney M, FENWICK O, BAXENDALE M and BILOTTI E. *Advanced Functional Materials*. Wiley.

Universal Control on Pyro-resistive Behaviour of Flexible Self-regulating Heating Devices.

LIU Y, ZHANG H, PORWAL H, TU W, Evans J, NEWTON M, BUSFIELD JJC, Peijs and Bilotti E. *Advanced Functional Materials*. Wiley.

Interlaminar toughening of woven fabric carbon/epoxy composite laminates using hybrid aramid/phenoxy interleaves.

Wong D, ZHANG H, BILOTTI E and PEIJS T. *Composites Part a: Applied Science and Manufacturing* vol. 101, 151-159. Elsevier.

Synergistic effects of filler size on thermal annealing-induced percolation in polylactic acid (PLA)/graphite nanoplatelet (GNP) nanocomposites.

Gao Y, Picot OT, Zhang H, Bilotti E and Peijs T. *Nanocomposites* vol. 3, (2) 67-75.

Graphite Nanoplatelet Modified Epoxy Resin for Carbon Fibre Reinforced Plastics with Enhanced Properties.

Li Y, Zhang H, Huang Z, Bilotti E and Peijs T. *Journal of Nanomaterials* vol. 2017.

Filtration effects of graphene nanoplatelets in resin infusion processes: Problems and possible solutions.

Zhang H, Liu Y, Huo S, Briscoe J, Tu W, Picot OT, Rezai A, Bilotti E and Peijs T. *Composites Science and Technology* vol. 139, 138-145.

Mechanical, Electrical and Thermal Properties of In-situ Exfoliated Graphene/Epoxy Nanocomposites.

ZHANG H, Li Y, porwal H, Huang Z, Bilotti E and Peijs T. *Composites Part a: Applied Science and Manufacturing*. Elsevier.

2016

Dissolvable thermoplastic interleaves for carbon nanotube localization in carbon/epoxy laminates with integrated damage sensing capabilities.

Zhang H, Liu Y, Huang M, Bilotti E and Peijs T. *Structural Health Monitoring* vol. 17, (1) 59-66. Sage Publications.

In Situ Exfoliation of Graphene in Epoxy Resins: A Facile Strategy to Efficient and Large Scale Graphene Nanocomposites.

Li Y, Zhang H, Crespo M, Porwal H, Picot O, Santagiuliana G, Huang Z, Barbieri E, Pugno NM, Peijs T and Bilotti E. *Acs Appl Mater Interfaces* vol. 8, (36) 24112-24122.

Effect of mixed fillers on positive temperature coefficient of conductive polymer composites.

Asare E, Basir A, Tu W, Porwal H, Zhang H, Liu Y, Evans J, Newton M, Peijs T and Bilotti E. *Nanocomposites* vol. 2, (2) 58-64.

Enhanced Thermal and Electrical Properties of Polystyrene-Graphene Nanofibers via Electrospinning.

Li Y, Porwal H, Huang Z, Zhang H, Bilotti E and Peijs T. *Journal of Nanomaterials* vol. 2016.

Optimization of Three-Roll Mill Parameters for In-Situ Exfoliation of Graphene.

Li Y, Zhang H, Bilotti E and Peijs T. *Mrs Advances* vol. 1, (19) 1389-1394.

Graphene Delivery Systems for Hierarchical Fiber Reinforced Composites.

Li Y, Zhang H, Peijs T and Bilotti E. *Mrs Advances* vol. 1, (19) 1339-1344.

Nano-engineered hierarchical carbon fibres and their composites: Preparation, properties and multifunctionalities.

Zhang H, Bilotti E and Peijs T. *The Structural Integrity of Carbon Fiber Composites: Fifty Years of Progress and Achievement of The Science, Development, and Ap.*

2015

Localized toughening of carbon/epoxy laminates using dissolvable thermoplastic interleaves and electrospun fibres.

Zhang H, Bharti A, Li Z, Du S, Bilotti E and Peijs T. *Composites Part a: Applied Science and Manufacturing* vol. 79, 116-126.

The use of carbon nanotubes for damage sensing and structural health monitoring in laminated composites: a review.

Zhang H, Bilotti E and Peijs T. *Nanocomposites* vol. 1, (4) 167-184.

Static and dynamic percolation of phenoxy/carbon nanotube nanocomposites.

Zhang H, Bilotti E, Tu W, Lew CY and Peijs T. *European Polymer Journal* vol. 68, 128-138.

In-situ monitoring of interlaminar shear damage in carbon fibre composites.

Zhang H, Liu Y, Bilotti E and Peijs T. *Advanced Composites Letters* vol. 24, (4) 92-97.

In-Situ Monitoring of Interlaminar Shear Damage in Carbon Fibre Composites.

Zhang H, Liu Y, Bilotti E and Peijs T. *Advanced Composites Letters* vol. 24, (4).

Improved fracture toughness and integrated damage sensing capability by spray coated CNTs on carbon fibre prepreg.

Zhang H, Liu Y, Kuwata M, Bilotti E and Peijs T. *Composites Part a: Applied Science and Manufacturing* vol. 70, 102-110.

Integrated damage sensing in fibre-reinforced composites with extremely low carbon nanotube loadings.

Zhang H, Kuwata M, Bilotti E and Peijs T. *Journal of Nanomaterials* vol. 2015,.

2013

Controlling the dynamic percolation of carbon nanotube based conductive polymer composites by addition of secondary nanofillers: The effect on electrical conductivity and tuneable sensing behaviour.

Bilotti E, Zhang H, Deng H, Zhang R, Fu Q and Peijs T. *Composites Science and Technology* vol. 74, 85-90.