

KUNYAPAT THAMMAVICHAI

PhD in Material Engineering

19 Bartholomew Court, London E142DW

07543140063 • Kunyapat.thum@gmail.com • www.linkedin.com/in/Kunyapat

PROFESSIONAL SUMMARY	<ul style="list-style-type: none">• Expert in electrochromic properties investigation of nanomaterials.• Well-experienced in the synthesis, characterisation, processing of nanostructured materials, as well as various properties investigation of nanomaterials.• Highly experienced in thin film fabrication and nano-device development for energy related applications.																				
RESEARCH INTERESTS	<p>My research interests encompass the structure-process-property-application relationships by nano- and composite materials, with a passion for creating new generation of innovative nanomaterials and composite materials for sustainable and scalable energy technologies. Specifically, I am driven to investigate the area of transition metal oxide and their unique electrochromic properties for smart glass technology; organic composite materials for thermal energy storage and inorganic nanocomposite as electrocatalyst for hydrogen evolution.</p>																				
EDUCATION	<table><tr><td>Ph.D. in Materials Engineering</td><td>2018</td></tr><tr><td colspan="2">College of Engineering and Physical Sciences, University of Exeter, UK</td></tr><tr><td colspan="2">Thesis title: Tungsten oxide-based nanostructures and their electrochromic properties.</td></tr><tr><td colspan="2">Supervisor: Professor Yanqiu Zhu</td></tr><tr><td>MSc in Engineering Management</td><td>2012</td></tr><tr><td colspan="2">Engineering College, Brunel University, UK</td></tr><tr><td colspan="2">Thesis title: Lead and green in manufacturing</td></tr><tr><td>BSc in Chemical Engineering</td><td>2010</td></tr><tr><td colspan="2">Engineering Department, Mahidol University, Thailand</td></tr><tr><td colspan="2">Thesis title: The recovery of gold from gold plating solution via Cementation method.</td></tr></table>	Ph.D. in Materials Engineering	2018	College of Engineering and Physical Sciences, University of Exeter, UK		Thesis title: Tungsten oxide-based nanostructures and their electrochromic properties.		Supervisor: Professor Yanqiu Zhu		MSc in Engineering Management	2012	Engineering College, Brunel University, UK		Thesis title: Lead and green in manufacturing		BSc in Chemical Engineering	2010	Engineering Department, Mahidol University, Thailand		Thesis title: The recovery of gold from gold plating solution via Cementation method.	
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RESEARCH EXPERIENCE AND INTERSHIP	<table><tr><td>Research Assistant, Guangxi University, China</td><td>2019-2020</td></tr><tr><td colspan="2"><ul style="list-style-type: none">• Investigated electrochromic mechanism of tungsten oxide nanomaterials• Supervised undergraduate and postgraduate projects including MOFs/aerogel composite, iron oxide-based composites for photocatalytic degradation application, WS₂/PAO6 lubricants (finished manuscript draft) and rGO/MoS₂/NiS Nanosheets as an electrocatalyst for hydrogen evolution.</td></tr><tr><td>Research Fellow, University of Exeter, UK</td><td>2018-2020</td></tr><tr><td colspan="2"><ul style="list-style-type: none">• Developed a novel 3D carbon skeleton based on the cost-effective melamine foam, which exhibited high thermal conductivity, high flexibility and excellent cyclic behaviour with great anti-corrosion performance.</td></tr><tr><td>Research Assistant, Qioptiq Ltd, Denbighshire</td><td>2015-2018</td></tr><tr><td colspan="2"><ul style="list-style-type: none">• Led "Smart device project"; Successful smart glass prototypes can work under impressive temperatures ranging from 40 to -20 °C with 25% and 90% absorption for bleaching and coloration, respectively.</td></tr><tr><td>BSc Internship, PTT Public Company Limited, Thailand</td><td>2009</td></tr><tr><td colspan="2"><ul style="list-style-type: none">• Confirmed and analysed petroleum quality by using a range of characterization techniques, such as Viscometer, Digital density meters, Gas chromatography, etc.• Led and executed several small projects related to alternative bio-energy to successful completion.</td></tr></table>	Research Assistant , Guangxi University, China	2019-2020	<ul style="list-style-type: none">• Investigated electrochromic mechanism of tungsten oxide nanomaterials• Supervised undergraduate and postgraduate projects including MOFs/aerogel composite, iron oxide-based composites for photocatalytic degradation application, WS₂/PAO6 lubricants (finished manuscript draft) and rGO/MoS₂/NiS Nanosheets as an electrocatalyst for hydrogen evolution.		Research Fellow , University of Exeter, UK	2018-2020	<ul style="list-style-type: none">• Developed a novel 3D carbon skeleton based on the cost-effective melamine foam, which exhibited high thermal conductivity, high flexibility and excellent cyclic behaviour with great anti-corrosion performance.		Research Assistant , Qioptiq Ltd, Denbighshire	2015-2018	<ul style="list-style-type: none">• Led "Smart device project"; Successful smart glass prototypes can work under impressive temperatures ranging from 40 to -20 °C with 25% and 90% absorption for bleaching and coloration, respectively.		BSc Internship , PTT Public Company Limited, Thailand	2009	<ul style="list-style-type: none">• Confirmed and analysed petroleum quality by using a range of characterization techniques, such as Viscometer, Digital density meters, Gas chromatography, etc.• Led and executed several small projects related to alternative bio-energy to successful completion.					
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TEACHING AND SUPERVISION EXPERIENCE	Teaching Assistant , University of Exeter, UK 2015-2017 <ul style="list-style-type: none"> Demonstrated and produced lab demonstration for the Engineering Materials and Manufacture module (ECM-1107) for more than 100 hours, including injection tensile test experiments.
	Student Supervision , University of Exeter, UK 2016-2020 <ul style="list-style-type: none"> Mentored and guided final year undergraduate and postgraduate student projects.
AWARDS AND PRIZES	100 ASEAN talented Young Scientists award 2019 International Women in Engineering Day (INWED19), 1 st Poster Prize 2018 International Women in Engineering Day (INWED17), 2 nd Poster Prize 2017 Qioptiq Ltd. company funding 2015
LABORATORY AND COMPUTER SKILLS	<p>Synthesis techniques: Solvothermal, Sol gel, CVD and PVD.</p> <p>Characterisation: XRD, SEM, TEM, Raman spectroscopy, FTIR, XPS, Thermal conductivity, electrochemistry, UV-Vis spectroscopy, DSC, TAG tensile test and compression test.</p> <p>Device fabrication: Spin-coating, profilometer and electrochromic device assembly.</p> <p>Health & Safety: COSHH, risk assessment and office-based HS legislation.</p> <p>Computer skills: Origin, Casa XPS and Eva XPS.</p>
COMMUNITY ACTIVITIES	Workshop Organisation , University of Exeter, UK <ul style="list-style-type: none"> Planned, produced, and co-coordinated a one-day workshop with material research group, Organized laboratory workshops for small groups of students during University Open Days. Ambassador, Science , technology, engineering, and mathematics organization (STEM) <ul style="list-style-type: none"> participated in several STEM events as a volunteer such as TECH conference, Q&A with a school, science workshop for school etc. Women in Engineering Day (INWED18) Organisation , University of Exeter, UK <ul style="list-style-type: none"> Organized presentation and poster competition during the conference.
TECHING CERTIFICATIONS	Learning and Teaching in Higher Education (LTHE) stage 1 and 2, Advance HE
PROFESSIONAL MEMBERSHIPS	The Institution of Engineering and Technology (MIET) 2020 Science, Technology, Engineering and Math (STEM, Ambassador): 2018 Royal Society of Chemistry (AMRSC) 2015
PUBLICATIONS	In preparation: 1. K. Thummavichai , Y. Q. Zhu, A Review of TES Materials and Their Applications. 2. K. Thummavichai , O. Ola, Y. Chen, N. Wang, Y. Q. Zhu, Green Sucrose Carbon Foam/PCM/Graphene Composites Materials for High Performance TES. Submitted: 1. K. Thummavichai , P. S. Yong, O. Ola, Y. Chen, F. Xu, N. Wang, Y. Q. Zhu, Na-doped WO _x Ultrafine Nanowires and Their adsorption Performance (Catalyst Science and Technology). 2. O. Ola, Y. Chen, K. Thummavichai , Y. Q. Zhu, Two-Dimensional WS ₂ -g-C ₃ N ₄ Layered Heterostructures with Enhanced Pseudocapacitive and Electrocatalytic Properties (Journal of Materials Science and Technology). 3. W. Chen, K. Thummavichai , X. Chen, G. Liu, N. Wang*, Y. Zhu, A comprehensive study on the tribological performance of IF-WS ₂ nano-additives in PAO6 oil (Tribology letter)

4. G. Liu, **K. Thummavichai**, X. Lv, W. Chen, N. Wang*, Y. Zhu, Defect-Rich Heterogeneous rGO/MoS₂/NiS Nanosheets as an Efficient pH-universal Electrocatalyst for Hydrogen Evolution (Journal of Power source)

Published:

1. **K. Thummavichai**, Y. D. Xia, Y. Q. Zhu, Recent progress in chromogenic research of tungsten oxides towards energy-related applications, Progress in Material Science (2017), 88, 281-324. **IF: 31.14.**
2. **K. Thummavichai**, L. Trimby, N. Wang, C. David Wright, Y. Xia, Y. Zhu. Low Temperature Annealing Improve the Electrochromic and Degradation Behavior of Tungsten Oxide (WO_x) Thin Films, Journal of Physical Chemistry (2017), 121, 20498-20506. **IF: 4.536.**
3. **K. Thummavichai**, N. Wang, L. Lem, M. Phillips, C. Ton-That, H. Chang, C. Hu, F. Xu, Y. Xia, Y. Zhu, Lanthanide-doped W18O49 nanowires: synthesis, structure and optical properties, Material letters (2017), 214, 232-235. **IF: 2.572.**
- *4 **K. Thummavichai**, F. Xu, N. Neate, N. Wang, A. D. Sanctis, S. Russo, S. Zhang, Y. D. Xia and Y. Q. Zhu, Ce-doped bundles ultrathin diameter tungsten oxide nanowire with enhance electrochromic behaviours, Nanoscale (2018), 10, 4718-4726. **IF: 7.367.**
- *5 **K. Thummavichai**, N. Wang, Y. Xia, Y. Zhu, Effect of Low temperature treatment of tungsten oxide (WO_x) thin films on the electrochromic and degradation behavior, IEEE Nanotechnology Material and Devices Conference Proceedings (2016).
- *6 **K. Thummavichai**, N. Wang, F. Xu, G. Rance, Y. D. Xia, Y. Q. Zhu. In-situ X-ray diffraction and Raman Spectroscopy phase transition investigations of ultrathin W18O49 nanowires, Royal Society Open Science (2018), 4, 1-10. **IF: 2.243.**
7. N. Wang, Z. Yang, Y. Wang, **K. Thummavichai**, Y. Xia, O. Ghita, Y. Zhu. Interface and properties of inorganic fullerene tungsten sulphide nanoparticle reinforced poly(ether ketone) nanocomposites, Results in Physics (2017), 7, 2417-2424.
8. N. Wang, Z. Yang, **K. Thummavichai**, F. Xu, C. Hu, H. Chen, Y. Xia, Y. Zhu. Novel graphitic carbon coated IF-WS₂ reinforced poly(ether ether ketone) nanocomposites, RSC Advances (2017), 7, 35265-35273. **IF: 3.108.**
9. N. Wang, Z. Yang, F. Xu, **K. Thummavichai**, H. Chen, Y. Xia, Y. Zhu. A generic method to synthesise graphitic carbon coated nanoparticles in large scale and their derivative polymer nanocomposites, Scientific Report (2017), 7, 1-9. **IF 4.259.**
10. J. Ruan¹, **K. Thummavichai**, Y. Lu, Y. Q. Zhu, H. Yan. Phase transition and optical absorption evolution of WO₃ nanoparticles induced by pressure, Materials Research Express (Accepted Manuscript online 29 June 2018).
11. P. M. Pancorbo, **K. Thummavichai**, L. Clark, H. Change, N. Stone, Y. Q. Zhu. Novel Au-SiO₂-WO₃ Core-shell Nanocomposites for Surface-enhanced Raman Spectroscopy with Potential Application in Cancer Cell Imaging, Advanced Functional Material (2019), 29, 1903549 1-10.
12. D. Chen, Santosh K. Tiwari, Z. Ma, J. Wen, S. Liu, J. Li, F. Wei, **K. Thummavichai**, Z. Yang, Y. Zhu and N. Wang Phase Behavior and Thermo-Mechanical Properties of IF-WS₂ Reinforced PP-PET Blend-Based Nanocomposites, Polymer (2020), 12, 1-15. **IF 3.426.**
13. O. Ola, Y. Chen, **K. Thummavichai**, Y. Zhu, In Situ Fabrication of Dendritic Tin-Based Carbon Nanostructures for Hydrogen Evolution Reaction, Sustainable Energy & Fuels (2020), 4, 5223-5228. **IF 5.5.**

**PRESERNTTIONS AT
PROFESSIONAL
CONFERENCES**

International Women in Engineering Day (INWED19), Exeter

2019

Poster and oral Presentation,

Presentation title: Ce-doped WO_x nanowires and its electrochromic property.

International Women in Engineering Day (INWED17), Exeter

2017

Poster and oral Presentation

Presentation title: In-situ phase change study of tungsten oxide (WO _x) nanostructures. BIT's 3rd Annual World Congress of Smart Materials , Thailand <i>Oral Presentation</i>	2017
Presentation title: Ce-doped bundled tungsten oxide nanowires for enhanced electrochromic performance. 11th IEEE Nanotechnology Materials and Devices Conference (NMDC) , France <i>Oral Presentation</i>	2016
Presentation Title: Low Temperature Treatment of Tungsten Oxide (WO _x)Thin Films on the Electrochromic. 12th International conference on Materials Chemistry (MC12) , York <i>Poster Presentation</i>	2015
Presentation Title: Synthesis and characterization of bundles tungsten oxide nanowire doping different among of sodium metal (Na _x WO _y). 21nd Annual CSCST-SCI Conference Renewable Energy and Novel Materials for a sustainable Future , Surrey <i>Oral Presentation</i>	2017
Presentation Title: Solvothermal synthesis and characterization of bundles tungsten oxide nanowire.	

REFERENCES

Prof. Yanqiu Zhu, Chair of Function Material, University of Exeter, 01392723620, Y.Zhu@exeter.ac.uk
 Dr. Yougda Xia, Senior Lecturer in Functional Material, University of Exeter, 01392723683, Y.Xia@exeter.ac.uk
 Dr. Oluwafunmilola Ola, Leverhulme Early Career and Nottingham Research Fellow, University of Nottingham, 011574 87264, Oluwafunmilola.Ola1@nottingham.ac.uk
