

Professor Zoe Pikramenou PhD, BSc, MRSC CChem

Professor of Inorganic Chemistry and Photophysics
Leverhulme Trust Research Fellow (2012-14)

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About

Zoe Pikramenou runs an active interdisciplinary research programme on Photophysics in Nanoscience and Biomolecular Chemistry using supramolecular design and synthesis, coordination chemistry, luminescence spectroscopy and imaging.

The research area has received an internationally recognised profile with invited lectures at international and national congresses covering a breadth of chemical areas, publications in leading internationally scientific journals.

International collaborations with leading scientists in interdisciplinary projects involving chemistry, physics and recently chemical engineering, medical and computer sciences. She has received research grants from EPSRC, MRC, Leverhulme Trust, the Royal Society for developing programmes on supramolecular wires, luminescent nanoparticles in biology and more recently an EPSRC Discipline Hopping Award with Chemical Engineering has fostered research in flow studies.

She has also led EU grants, a Marie Curie Research Training Network and a COST D31 group of 8 research teams on the assembly of cyclodextrin wires in solution and surfaces. Other international collaborations have taken place through ESF COST actions in optical imaging, supramolecular chemistry and metallodrugs.

Research webpages (<http://chemweb.bham.ac.uk/~pikramez/index.htm>)

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Qualifications

- PhD in Chemistry, 1993, Michigan State University, E. Lansing, Michigan, USA
- B.Sc. in Chemistry, 1987, University of Athens, Athens, Greece

Biography

Pikramenou moved to the University of Birmingham in March 2000, following a lectureship at the University of Edinburgh. She completed her undergraduate degree in University of Athens, Greece, obtained her PhD at Michigan State University with Prof. D.G. Nocera (currently at MIT) and then followed postdoctoral work with Prof. J.-M. Lehn (1987 Nobel Laureate) in Strasbourg.

Teaching

Teaching Programmes

- Year 4 MSci /PG level Chemistry- "Application of Luminescent Probes"
- Year 3 MSci/ BScChemistry- " f-Block Chemistry"
- Year 2 Chemistry "Structure and Bonding in Coordination and Organometallic Complexes"

Postgraduate

- Chemistry Ph.D. and PSIBS "Ethics in Research"
- PSIBS "Molecular and Nanoscale Luminescent Probes in Chemistry"

Research

RESEARCH THEMES:

Imaging, Energy, Chemical Biology

RESEARCH ACTIVITY

The design of probes with characteristic optical or magnetic response is important in the development of luminescent and MRI agents for imaging and sensing as well as in the function of photonic materials. The research in our group is based on bringing together supramolecular design and nanoscale properties to tailor spectroscopic responses through structure control.

Examples of research projects are shown below and include molecular synthesis, spectroscopic studies and surface characterisation of supramolecular and nanoscale assemblies.

Imaging

Luminescent nanoparticles as flow trackers

Nanoparticle delivery in cells

Luminescence Imaging

Nanowires based on supramolecular assembly

Energy

Supramolecular systems for light conversion devices

Inorganic dyes for solar cells; Luminescent sensors

Chemical Biology

DNA recognition by luminescent metal complexes

Research group web pages: chemweb.bham.ac.uk/~pikramez/index.htm (<http://chemweb.bham.ac.uk/~pikramez/index.htm>).

Publications

Selected Publications:

A. Davies, D. J. Lewis, S. P. Watson, S. G. Thomas and Z. Pikramenou "pH Controlled Delivery of Luminescent Europium Coated Nanoparticles into Platelets", *Proc. Nat. Acad. Sci.* **2012**, *109*, 1862-1867 (<http://www.pnas.org/content/109/6/1862.full.pdf+html>).

D.J Lewis, V. Dore, M. J Goodwin, A. C Savage¹, G.B Nash, P.Angeli and Z.Pikramenou "Luminescent ruthenium(II) tris-bipyridyl complex caged in nanoscale silica for particle velocimetry studies in microchannels" *Meas. Sci. Technol.* **2012**, *23*, 084004, 1-9 (<http://iopscience.iop.org/0957-0233/23/8/084004;jsessionid=578513700326D190B6AE50117DF4FA98.c3>).

L. E. P. Kyllönen, V. Chinuswamy, D. Maffeo, E. T. Kefalas, J.M. Haider, Z. Pikramenou, I. M. Mavridis, K. Yannakopoulou and N. Glezos "Electronic transport between Au surface and STM tip via a multipodal cyclodextrin host - metallo-guest supramolecular systems" *J. Phys. Org. Chem.* **2012**, *25*, 198-206 (<http://onlinelibrary.wiley.com/doi/10.1002/poc.1889/abstract>).

A. C. Savage and Z. Pikramenou "Peptide coated gold nanoparticles that bind lanthanide ions" *Chem. Comm.* **2011**, *47*, 6431-6433 DOI:[10.1039/C1CC11477H](https://doi.org/10.1039/C1CC11477H) (<http://pubs.rsc.org/en/content/articlelanding/2011/CC/c1cc11477h>).

D. J. Lewis, P. B. Glover, M. C. Solomons and Z. Pikramenou "Formation of Purely Heterometallic Lanthanide(III) Macrocycles Through Controlled Assembly of Disulfide Bonds" *J. Am. Chem. Soc.*, **2011**, *133*, 1033-1043. DOI:[10.1021/ja109157g](https://doi.org/10.1021/ja109157g) (<http://pubs.acs.org.ezproxye.bham.ac.uk/stoken/campaign/imagechallenge/abs/10.1021/ja109157g>)

D. J. Lewis, C. Bruce, S. Bohic, S. P. Hammond, D. Arbon, Z. Pikramenou and B. Kysela "Intracellular Synchrotron Nanoimaging and DNA Damage/Genotoxicity Testing of Novel Lanthanide-Coated Nanovectors", *Nanomedicine*, **2010**, *5*, 1547-1557. DOI:[10.2217/nnm.10.96](https://doi.org/10.2217/nnm.10.96).

L. L. Ruston, G. M. Robertson and Z. Pikramenou "Luminescence Screening Assays for Identification of Sensitisers for Lanthanides based on the Controlled Formation of Ternary Lanthanide Complexes with DTPA-bisamide Ligands" *Chem Asian J.* **2010**, *5*, 571-580. DOI:[10.1002/asia.200900367](https://doi.org/10.1002/asia.200900367) (<http://onlinelibrary.wiley.com.ezproxye.bham.ac.uk/doi/10.1002/asia.v5:3/issuetoc>)

J. A. Faiz, A. I. Philippopoulos, A. G. Kontos, P. Falaras and Z. Pikramenou "Functional Supramolecular Ruthenium Cyclodextrin Dyes for Nanocrystalline Solar Cells" *Adv. Funct. Mat.* **2007**, *1*, 54-58. DOI:[10.1002/adfm.200600188](https://doi.org/10.1002/adfm.200600188) (<http://dx.doi.org/10.1002/adfm.200600188>).

P. B. Glover, A. P. Bassett, P. Nockemann, B. M. Kariuki, R. Van Deun and Z. Pikramenou "Fully fluorinated imidodiphosphinate shells for visible- and NIR-emitting lanthanides: hitherto unexpected effects of sensitizer fluorination on lanthanide emission properties" *Chem. Eur. J.* **2007**, *13*, 6308-6320. DOI: [10.1002/chem.200700087](https://doi.org/10.1002/chem.200700087) (<http://dx.doi.org/10.1002/chem.200700087>).

J. A. Faiz, R. M. Williams, M. J. J. Pereira Silva, L. De Cola and Z. Pikramenou, "A Unidirectional Energy Transfer Cascade Process in a Ruthenium Junction Self-Assembled by a- and b- Cyclodextrins" *J. Am. Chem. Soc.* **2006**, *128*, 4520-4521. DOI: [10.1021/ja058541h](https://doi.org/10.1021/ja058541h) (http://pubs3.acs.org/acs/journals/doilookup?in_doi=10.1021/ja058541h).

M. Haider and Z. Pikramenou, "Photoactive Metallocyclodextrins: Sophisticated Supramolecular Arrays for the Construction of Light Activated Miniature Devices" *Chem. Soc. Rev.*, **2005**, *34*, 120-132. DOI: [10.1002/chin.200521273](https://doi.org/10.1002/chin.200521273) (<http://www.rsc.org/publishing/journals/CS/article.asp?doi=b203904b>).

A. P. Bassett, S. W. Magennis, P. B. Glover, D. J. Lewis, N. Spencer, S. Parsons, R. M. Williams, L. De Cola, Z. Pikramenou "Highly Luminescent, Triple- and Quadruple-stranded, Dinuclear Eu, Nd, and Sm(III) Lanthanide Complexes Based on Bis-diketonate Ligands" *J. Am. Chem. Soc.*, **2004**, *126*, 9413-9424. DOI: [10.1021/ja048022z](http://dx.doi.org/10.1021/ja048022z) (<http://dx.doi.org/10.1021/ja048022z>).

P. B. Glover, P. R. Ashton, L. J. Childs, A. Rodger, M. Kercher, R. M. Williams, L. De Cola, Z. Pikramenou "Hairpin-shaped Heterometallic Luminescent Lanthanide Complexes for DNA Intercalative Recognition" *J. Am. Chem. Soc.*, **2003**, *125*, 9918-9919. DOI: [10.1021/ja029886s](http://dx.doi.org/10.1021/ja029886s) (<http://dx.doi.org/10.1021/ja029886s>).

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