

Professor Jon Preece

Head of School
Professor of Nanoscale Chemistry

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Qualifications

- 2004-present Professor of Nanoscale Chemistry at the University of Birmingham
- 2000-2004 Senior Lecturer in Organic Chemistry at the University of Birmingham
- 1999-2000 Lecturer in Organic Chemistry at the University of Birmingham
- 1996-1998 University Research Fellow in Nanoscale Chemistry at the University of Birmingham
- 1996-1997 Marie-Curie Research Fellow at the Johannes Gutenberg-Universität (Germany) in the Research Group of Professor Helmut Ringsdorf
- 1995-1996 Royal Society Research Fellow at the Johannes Gutenberg-Universität (Germany) in the Research Group of Professor Helmut Ringsdorf
- 1991-1994 PhD from the University of Birmingham with Thesis entitled "From Self-Assembly to Self-Organisation" in the Research Group of Professor J Fraser Stoddart, FRS
- 1986-1990 BSc (Honours) First Class from Loughborough University of Technology in Pure Chemistry

Research

Research Interests

- Nanoscale Science
- Noncovalent Bonding
- Self-Assembly
- Self-Organisation
- Recognition Phenomena
- C60
- Electron Beam Resists
- Liquid Crystals
- Self-Assembled Monolayers
- Nano-Tribology

Jon Preece began his academic research career in the Group of Professor J Fraser Stoddart (Birmingham, 1991-1994) carrying out research in the area of supramolecular chemistry, with particular interest in the design, synthesis and characterisation of materials which could be switched between different states. This interest in materials chemistry led JAP to join the Research Group of Professor Helmut Ringsdorf for a period of two years (1995-1996) where he gained experience in aspects of materials surface science. Currently, the JAP Group carry out research in the area of nanoscale materials science. For example, new nanoscale-materials (i) for electron beam resists, (ii) for the assembly of inorganic/organic hybrid nanoparticles with novel electro-optic, structural and medicinal properties (gene delivery), (iii) for liquid crystals, and (iv) for surfaces used in technological applications. The research is or has been supported by the EPSRC, BBSRC, European Community (RTN, STREP), The Leverhulme Trust and NEDO (Japan), as well as two leading British Companies (BASYSYSTEMS and BNFL).

Publications

Recent Publications

- **'Novel 3,4-Disubstituted Thiophenes for Weak Passivation of Au Nanoparticles'** P. Iqbal, K. Critchley, S. Begum, D. Attwood, S.D. Evans, I.P. Jones, J.A. Preece, *J. Exp. Nanosci.*, Accepted.
- **'Micro- and Nano-Scale Photopatterning of Thiol Passivated Gold Nanoparticles'** S. Sun, P.M. Mendes, K. Critchley, S.D. Evans, G.J. Leggett, J.A. Preece, *Nanoletters*, Accepted.
- **Liquid Crystal'** K.J. Donovan, K. Scott, M. Somerton, M. Manickam, J.A. Preece, *Chem. Phys*, Accepted.
- **'Making Electrical Nanocontacts to Nanocrystal Assemblies: Mapping of Room-Temperature Coulomb-Blockade Thresholds in Arrays of 28-kDa Gold Nanocrystals'** G.A. O'Brien, A.J. Quinn, M. Biancardo, J.A. Preece, C.A. Bignozzi, G. Redmond, *Small*, 2006, 2, 261-266.

2005

- **'Analysis of Charge Transport in Arrays of 28kDa Nanocrystal Gold Molecules'** A.J. Quinn, M. Biancardo, L. Floyd, M. Belloni, P.R. Ashton, J.A. Preece, C.A. Bignozzi, G. Redmond, *J. Mat. Chem.*, 2005, 15, 4403-4407.

- **'Electrostatically Stabilised Nanoparticles: Self-Organisation and Electron-Beam Patterning'** J.L. Plaza, P.M. Mendes, S. Diegoli, Y. Chen, J.A. Preece, R.E. Palmer, *Journal of Nanoscience and Nanotechnology*, 2005, 5, 1-6.
- **'Design of Potentially Photorefractive Liquid Crystalline Materials: Derivatives of 3,6-Disubstituted Carbazole'** M. Belloni, B.M. Kariuki, M. Manickam, J. Wilkie, J.A. Preece, *Crystal Growth and Design*, 2005, 5, 1443-1450.
- **'A Versatile Reducible Polycation-Based System for Efficient Delivery of a Broad Range of Nucleic Acids'** M.L. Read, S. Singh, Z. Ahmed, M. Stevenson, S.S. Briggs, D. Oupicky, L.B. Barrett, R. Spice, M. Kendall, M. Berry, J.A. Preece, A. Logan, L.W. Seymour, *Nucleic Acids Research*, 2005, In Press..
- **'Hysteresis of Charge Tunnelling in Assemblies of Carboxylic Acid-Modified Gold Nanoparticles'** M. Biancardo, A.J. Quinn, L. Floyd, P.M. Mendes, S.S. Briggs, J.A. Preece, C.A. Bignozzi, G. Redmond, *J. Phys. Chem. B*, 2005, 109, 8718-8722.

2004

- **'Precision Chemical Engineering: Integrating Top-Down and Bottom-Up Methodologies'** P.M. Mendes, J.A. Preece, *Current Opinion in Colloid and Interfacial Science*, Invited Review Article, 2004, 9, 236-248.
- **'Integrating Nanolithography and Nanoassembly: Does Precision Chemical Engineering Hold the Key to Future Nanofabrication?'** P.M. Mendes, J.A. Preece, *RSC Materials Chemistry Forum*, Issue 6, 2004, 8-9.
- **'Nanostructuring Surfaces into the Third Dimension by Integrating Top-Down and Bottom-up Methodologies'** P.M. Mendes, J.A. Preece, *Transworld Research Network: Recent Research Developments in Chemical Physics*, 2004, 5, 199-209.
- **'Gold Nanoparticle Patterning of Silicon Wafers Using Chemical e-Beam Lithography'** P. Mendes, S. Jacke, Y. Chen, S.D. Evans, K. Critchley, K. Nikitin, R. E. Palmer, D. Fitzmaurice, J.A. Preece, *Langmuir*, 2004, 20, 3766-3768.
- **'Polymer-Coated Polyethylenimine/DNA Complexes Designed for Triggered Activation by Intracellular Reduction'** Robert C. Carlisle, Tomas Etrych, Simon S. Briggs, J.A. Preece, Karel Ulbrich, Leonard W. Seymour, *J. Gene Med.*, 2004, 6, 337-344.

2003

- **'Nanostructures >From Nanoparticles'** P. Mendes, Y. Chen, R. E. Palmer, K. Nikitin, D. Fitzmaurice, J.A. Preece, *J. Phys.: Condens. Matter*, 2003, 15, S3047-S3063.
- **'Triphenylene/Carbazole Mesogens and their Electrochemistry'** M. Manickam, G. Cooke, S. Kumar, P.R. Ashton, N. Spencer, J.A. Preece, *Molecular Crystals and Liquid Crystals*, 2003, 397, 99-116.
- **'Toward Boronate Ester Mesogenic Structures'** M. Belloni, M. Manickam, Z.H. Wang, J.A. Preece, *Molecular Crystals and Liquid Crystals*, 2003, 399, 93-114.
- **'A Novel Example of X-Ray Radiation Induced Chemical Reduction of an Aromatic Nitro Containing Thin Film on SiO₂ to an Aromatic Amine Film'** P. Mendes, M. Belloni, M. Ashworth, C. Hardy, K. Nikitin, D. Fitzmaurice, K. Critchley, S.D. Evans, J.A. Preece, *ChemPhysChem*, 2003, 4, 884-889.

2002

- **'Multi-adduct Derivatives of C₆₀ for Electron Beam Nano-Resists'** T. Tada, K. Uekusu, T. Kanayama, T. Nakayama, R. Chapman, W.Y. Cheung, L. Eden, I. Hussain, M. Jennings, J. Perkins, M. Philips, J.A. Preece, E.J. Shelley, *Microelectronic Engineering*, 2002, 61, 737-743.
- **'Dialkyl Sulfides: Novel Passivating Agents for Gold Nanoparticles'** E.J. Shelley, D. Ryan, M. Couillard, D. Fitzmaurice, R.E. Palmer, P.D. Nellist, J.A. Preece, Y. Chen, *Langmuir*, 2002, 18, 1791-1795.
- **'HREELS Studies of Gold Nanoparticles with Dialkyl Sulfide Ligands'** Y. Chen, R.E. Palmer, E.J. Shelley, J.A. Preece, *Surface Science*, 2002, 502/503, 208-213.
- **'Towards Carbazole Based Banana-shaped Liquid Crystals Incorporating Carbazole'** M. Belloni, M. Manickam, J.A. Preece, *Ferroelectrics.*, 2002, 276, 103-126.
- **'Introduction of bis-Discotic and bis-Calamitic Mesogenic Addends to C₆₀'** A. Smith, M. Manickam, M. Belloni, P.R. Ashton, J.A. Preece, N. Spencer, *Liquid Crystals*, 2002, 29, 497-504.

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- **'Improved Sensitivity of Multi-adduct Derivatives of Fullerene'** T. Tada, K. Uekusu, T. Kanayama, T. Nakayama, R. Chapman, W.Y. Cheung, L. Eden, I. Hussain, M. Jennings, J. Perkins, M. Philips, J.A. Preece, E.J. Shelley, *Journal of Photopolymer Science and Technology*, 2001, 14, 543-546.
- **'The First Hexagonal Columnar Discotic Liquid Crystalline Carbazole Derivative Induced by Noncovalent p-p Interactions'** M. Manickam, M. Belloni, S.K. Varshney, D.S. Shankar Rao, P.R. Ashton, S. Kumar, J.A. Preece, N. Spencer, *J. Mater. Chem.*, 2001, 11, 2790-2800.
- **'An X-ray Crystal Structure and Computational Analysis of a Banana-Shaped Mesogenic Structure and Thermal Analysis of its Higher Homologues'** M. Belloni, M. Manickam, P.R. Ashton, J.A. Preece, N. Spencer, J. Wilkie *Mol. Cryst. Liq. Cryst.*, 2001, 369, 17-35.
- **'The Characterisation of the Intercolumnar Ordering of Triphenylene Based Mesogens by Interdigitation of Alkyl Chains'** M.T. Allen, S. Diele, K.D.M. Harris, T. Hegmann, B.M. Kariuki, D. Lose, J.A. Preece, C. Tschierske, *J. Mater. Chem.*, 2001, 11, 302-311

