

# CURRICULUM VITAE

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## Education

July 1983                          University of Bristol, BSc Chemistry (first class)

Sept 1987                          University of Bristol, PhD Chemistry

## Academic Career

1987-1989:                        Postdoctoral fellow at Los Alamos National Laboratory, USA.

1989-1995:                        Lecturer in Polymer Science at the University of Sussex, UK.

October 1995:                    Senior Lecturer at the University of Sussex, UK.

October 1999:                    Reader at the University of Sussex, UK.

April 2000:                        Professor at the University of Sussex, UK.

June 2004 to date:                Professor at the University of Sheffield, UK.

June 2008 to date:                Director of the Sheffield Polymer Centre, METRC and Farapack Polymers

Nov 2013 to date:                Director of £7.1 M Polymers, Soft Matter and Colloids CDT at U. Sheffield

May 2014:                         Elected as a Fellow of the Royal Society (FRS)

**Grants, Awards and Prizes.** ERC *Advanced Investigator* grant-holder (2013-2017). Received more than 35 EPSRC research grants, including three Platform Grants as Principal Investigator. Recipient of the 2014 RSC Interdisciplinary Prize, the 2013 RSC Tilden Prize, the RSC 2010 Peter Day award for soft matter research and the 2007 RSC Macro Group Medal for contribution to UK polymer science. Delivered the 2014 Thomas Graham Lecture for The RSC Joint Colloid committee and the 2015 Colloid and Polymer Science Lecture for the German Colloid Society. Recipient of a Royal Society/Wolfson Research Merit Award (2005-2009).

**Academic Research Record and Professional Activities.** More than 515 publications in refereed journals (H-index = 93). Named inventor on 20 patents. Invited to join 9 journal editorial boards.

### List of Refereed Publications

1. "A novel route for producing soluble polyacetylene / polyisoprene block copolymers", S. P. Armes\*, B. Vincent and J. W. White, *J. Chem. Soc., Chem. Commun.*, 1526-1527 (1986).
2. "Dispersions of electrically conducting polypyrrole particles in aqueous media", S. P. Armes\* and B. Vincent, *J. Chem. Soc., Chem. Commun.*, 288-290 (1987).
3. "Optimum reaction conditions for the polymerisation of pyrrole by iron (III) chloride in aqueous solution", S. P. Armes, *Synth. Met.*, 20, 367-371 (1987).
4. "Aqueous dispersions of electrically conducting monodisperse polypyrrole particles", S. P. Armes, J. F. Miller and B. Vincent\*, *J. Colloid Interface Sci.*, 118, 410-416 (1987).
5. "Optimum reaction conditions for the polymerisation of aniline in aqueous solution by ammonium persulphate", S. P. Armes\* and J. F. Miller, *Synth. Met.*, 22, 385-393 (1988).
6. "Post-doping of sterically-stabilized polyacetylene latexes", S. P. Armes\* and B. Vincent, *Synth. Met.*, 25, 171-179 (1988).
7. "Poly(vinyl pyridine)-based stabilizers for aqueous polypyrrole latices", S. P. Armes\*, M. Aldissi and S. F. Agnew, *Synth. Met.*, 28, 837-848 (1989).
8. "Novel colloidal dispersions of polyaniline", S. P. Armes\* and M. Aldissi, *J. Chem. Soc., Chem. Commun.*, 88-89 (1989).
9. "The preparation and characterisation of colloidal dispersions of polypyrrole using poly(2-vinyl pyridine)-based steric stabilizers", S. P. Armes\* and M. Aldissi, *Polymer*, 31, 569-574 (1990).
10. "Potassium iodate oxidation route to polyaniline: an optimization study", S. P. Armes\* and M. Aldissi, *Polymer*, 32, 2043-2048 (1991).
11. "Non-aqueous polypyrrole colloids: synthesis and characterisation", S. P. Armes\* and M. Aldissi, *Synth. Met.*, 37, 137-144 (1990).
12. "Synthesis and characterization of aqueous colloidal dispersions of poly(vinyl alcohol)/polyaniline particles", S. P. Armes\*, M. Aldissi, S. F. Agnew and S. Gottesfeld, *Mol. Cryst. Liq. Cryst.*, 190, 63-74 (1990).
13. "Particle size distributions of polypyrrole colloids", S. P. Armes\*, M. Aldissi, G. C. Idzorek, P. W. Keaton, L. J. Rowton, G. L. Stradling, M. T. Collopy and D. B. McColl, *J. Colloid Interface Sci.*, 141, 119-126 (1991).
14. "Aqueous colloidal dispersions of polyaniline using poly(vinyl pyridine)-based steric stabilizers", S. P. Armes\*, M. Aldissi, S. F. Agnew and S. Gottesfeld, *Langmuir*, 6, 1745-1749 (1990).
15. "Colloidal dispersions of conducting polymers", M. Aldissi\* and S. P. Armes, *Prog. Org. Coatings*, 19, 21-58 (1991).

16. "High pressure conductivity and morphology of conducting polymer colloids", M. C. Aronson, M. Aldissi\*, S. P. Armes and J. D. Thompson, *Synth. Met.*, 41-43, 837-842 (1991).
17. "Electrically conductive polyacetylene copolymers", S. P. Armes, *Synth. Met.*, 44, 95-98 (1991).
18. "Poly(1-vinylimidazole-co-4-aminostyrene) steric stabilisers for polyaniline colloids", R. F. C. Bay, S. P. Armes\*, C. J. Pickett and K. S. Ryder, *Polymer*, 32, 2456-2460 (1991).
19. "Conducting polymer-colloidal silica composites", S. P. Armes\*, S. Gottesfeld, J. G. Beery, F. Garzon and S. F. Agnew, *Polymer*, 32, 2325-2330 (1991).
20. "Morphology and structure of conducting polymers", S. P. Armes\*, M. Aldissi, M. Hawley, J. G. Beery and S. Gottesfeld, *Langmuir*, 7, 1447-1452 (1991).
21. "Characterization of conducting polymer-quartz composites", S. P. Armes\*, S. Gottesfeld, J. G. Beery, F. Garzon, C. Mombourquette, M. Hawley and H. H. Kuhn, *J. Mater. Chem.*, 1, 525-529 (1991).
22. "Novel colloidal polyaniline-silica composites", M. Gill, J. Mykytiuk, S. P. Armes\*, J. L. Edwards, T. Yeates, P. J. Moreland and C. Mollett, *J. Chem. Soc., Chem. Commun.*, 108-109 (1992).
23. "XPS study of bulk and colloidal polyaniline", M. Aldissi\* and S. P. Armes, *Macromolecules*, 25, 2963-2968 (1992).
24. "Synthesis of novel polyaniline colloids using chemically grafted poly(*N*-vinylpyrrolidone)-based steric stabilisers", C. DeArmitt and S. P. Armes\*, *J. Colloid. Interface Sci.*, 150, 134-142 (1992).
25. "Preparation and characterisation of polyaniline colloids using monodisperse poly(ethylene oxide)-based steric stabilisers", P. Tadros, S. P. Armes\* and S. Y. Luk, *J. Mater. Chem.*, 2, 125-130 (1992).
26. "Electrically conductive polyaniline-copolymer latex composites", P. Beadle, S. P. Armes\*, S. Gottesfeld, C. Mombourquette, R. Houlton, W. D. Andrews and S. F. Agnew, *Macromolecules*, 25, 2526-2530 (1992).
27. "Group transfer polymerisation of benzyl methacrylate: a convenient route for synthesis of monodisperse poly(methacrylic acid)", J. Mykytiuk, S. P. Armes and N. C. Billingham\*, *Polym. Bull.*, 29, 139-145 (1992).
28. "The application of a polypyrrole pre-coat for the metallization of printed circuit boards", S. Gottesfeld\*, F. A. Uribe and S. P. Armes, *J. Electrochem. Soc.*, 139, 14-15 (1992).
29. "Dynamic light scattering studies on sterically-stabilised polypyrrole colloids", Z. Rawi, J. Mykytiuk and S.P. Armes\*, *Colloids Surf.*, 68, 215-218 (1992).
30. "Particle size distributions of polyaniline-silica composites", M. Gill, S. P. Armes\*, D. Fairhurst, S. Emmett, T. Pigott and G. Idzorek, *Langmuir*, 8, 2178-2182 (1992).
31. "Synthesis of monodisperse copolymers containing methacrylic acid segments by group transfer polymerisation: choice of protecting group and catalyst", S. P. Rannard, N. C. Billingham\*, S. P. Armes and J. Mykytiuk, *Eur. Polym. J.*, 29, 407-414 (1993).
32. "A novel water-soluble polyaniline derivative", C. DeArmitt, S. P. Armes\*, J. Winter, F. A. Uribe, C. Mombourquette and S. Gottesfeld, *Polymer*, 34, 158-162 (1993).

33. "Characterisation of polypyrrole fibre composites by time-of-flight secondary ion mass spectrometry and vibrational spectroscopy", M. J. Hearn, I. W. Fletcher, S. Church and S. P. Armes\*, *Polymer*, 34, 262-266 (1993).
34. "Preparation and characterisation of polypyrrole colloids in non-aqueous media", M. Beaman and S. P. Armes\*, *Colloid Polym. Sci.*, 271, 70-75 (1993).
35. "Synthesis and characterisation of sterically-stabilised colloidal dispersions of polypyrrole using novel tailor-made water-soluble block copolymers of narrow molecular weight distribution", P. Beadle, L. Rowan, J. Mykytiuk, N. C. Billingham and S. P. Armes\*, *Polymer*, 34, 1561-1563 (1993).
36. "Surfactant-stabilised polypyrrole colloids", C. DeArmitt and S. P. Armes\*, *Langmuir*, 9, 652-654 (1993).
37. "Preparation of novel polypyrrole-silica colloidal composites", S. Maeda and S. P. Armes\*, *J. Colloid Interface Sci.*, 159, 257-259 (1993).
38. "Preparation and characterisation of electrically conductive-superparamagnetic polyester textiles", C. Forder, S. P. Armes\*, A. W. Simpson, C. Maggiore and M. Hawley, *J. Mater. Chem.*, 3, 563-569 (1993).
39. "Small-angle X-ray scattering studies on colloidal dispersions of polyaniline-silica composites", N. J. Terrill, T. Crowley\*, M. Gill and S. P. Armes, *Langmuir*, 9, 2093-2096 (1993).
40. "Synthesis and characterisation of novel polypyrrole colloids", P. Beadle and S. P. Armes\*, *Synth. Met.*, 55-57, 1114-1118 (1993).
41. "Preparation and characterisation of novel polypyrrole-silica colloidal nanocomposites", S. Maeda and S. P. Armes\*, *J. Mater. Chem.*, 4, 935-942 (1994).
42. "Synthesis of polypyrrole-silica-magnetite nanocomposite colloids", M. D. Butterworth, S. P. Armes\* and A. W. Simpson, *J. Chem. Soc., Chem. Commun.*, 2129-2130 (1994).
43. "Determination of the structure of 2,2'-bithiophene-5-carbaldehyde", S. P. Armes, P. A. Chaloner\*, P. B. Hitchcock and M. R. Simmons, *Acta Cryst. C, Cryst. Struct. Commun.*, 50(12), 1945-1947 (1994).
44. "Preparation and characterisation of polypyrrole-tin (IV) oxide nanocomposite colloids", S. Maeda and S. P. Armes\*, *Chem. Mater.*, 7, 171-178 (1995).
45. "A study of the chemical polymerisation of pyrrole onto printed circuit boards for electroplating applications", M. Saurin and S. P. Armes\*, *J. Appl. Polym. Sci.*, 56, 41-50 (1995).
46. "Polypyrrole-tin(IV) oxide colloidal nanocomposites", S. Maeda and S. P. Armes\*, *Synth. Met.*, 69, 499-500 (1995).
47. "Synthesis of colloidal dispersions of polypyrrole-silica nanocomposites using 'stringy' silica particles", R. Flitton, J. Johal, S. Maeda and S. P. Armes\*, *J. Colloid Interface Sci.*, 173, 135-142 (1995).
48. "Synthesis of poly(vinyl alcohol)s of narrow molecular weight distribution from poly(benzyl vinyl ether) precursor polymers", C. Forder, N. C. Billingham and S. P. Armes\*, *Polym. Bull.*, 35, 291-297 (1995).
49. "Surface-enhanced Raman spectroscopy, time-of-flight secondary ion mass spectrometry and X-ray photoelectron spectroscopy studies on surfactant-stabilised conducting polymer

- colloids", S. Y. Luk, M. Keane, W. Lineton, C. DeArmitt and S. P. Armes\*, *J. Chem. Soc., Faraday Trans.*, 91, 905-910 (1995).
50. "Surface area measurements on conducting polymer-silica nanocomposites", S. Maeda and S. P. Armes\*, *Synth. Met.*, 73, 151-155 (1995).
51. "Synthesis and characterisation of carboxylic acid-functionalised polypyrrole-silica microparticles", S. Maeda, R. Corradi, and S. P. Armes\*, *Macromolecules*, 28, 2905-2911 (1995).
52. "Surface characterization of conducting polymer-silica nanocomposites by x-ray photoelectron spectroscopy", S. Maeda, M. Gill, S. P. Armes\* and I. W. Fletcher, *Langmuir*, 11, 1899-1904 (1995).
53. "Zeta potential measurements on conducting polymer-inorganic oxide nanocomposite colloids" M. D. Butterworth, S. Maeda, J. Johal, R. Corradi, S. F. Lascelles and S. P. Armes\*, *J. Colloid Interface Sci.*, 174, 510-517 (1995).
54. "Synthesis and characterisation of micrometer-sized polypyrrole-coated polystyrene latexes", S. F. Lascelles and S. P. Armes\*, *Adv. Mater.*, 7, 864-866 (1995).
55. "Characterization of conducting polymers by inverse gas chromatography: surface thermodynamic properties of tosylate-doped polypyrrole", M. M. Chehimi\*, S. F. Lascelles and S. P. Armes, *Chromatographia*, 41, 671-675 (1995).
56. "Synthesis of colloidal polypyrrole particles using reactive polymeric stabilisers", M. Simmons, P. A. Chaloner and S. P. Armes\*, *Langmuir*, 11, 4222-4224 (1995).
57. "X-ray photoelectron spectroscopy studies on sterically stabilised polypyrrole particles", P. M. Beadle, S. P. Armes\*, S. J. Greaves, J. F. Watts, *Langmuir*, 12, 1784-1788 (1996).
58. "Novel hydrophilic-hydrophilic block copolymers based on poly(vinyl alcohol)", C. F. Forder, C. S. Patrickios, N. C. Billingham and S. P. Armes\*, *J. Chem. Soc., Chem. Commun.*, 883-884 (1996).
59. "Synthesis and solution properties of water-soluble hydrophilic-hydrophobic block copolymers", F. L. Baines, S. P. Armes and N. C. Billingham, *Macromolecules*, 29, 3416-3420 (1996).
60. "Use of block copolymer stabilizers in the dispersion polymerisation of styrene in alcoholic media", F. L. Baines, S. Dionisio, N. C. Billingham, S. P. Armes\*, *Macromolecules*, 29, 3096-3102 (1996).
61. "Synthesis of polybetaines with narrow molecular weight distribution and controlled polymer architecture", A. B. Lowe, S. P. Armes\* and N. C. Billingham, *J. Chem. Soc., Chem. Commun.*, 1555-1556 (1996).
62. "Synthesis and characterisation of amphiphilic diblock copolymers of methyl tri(ethylene glycol) vinyl ether and isobutyl vinyl ether", C. S. Patrickios, C. F. Forder, S. P. Armes\* and N. C. Billingham, *J. Polym. Sci., Part A: Polym. Chem.*, 34, 1529-1541 (1996).
63. "Surface characterisation of colloidal polypyrrole particles synthesised with reactive steric stabilisers using X-ray photoelectron spectroscopy", M. R. Simmons, P. A. Chaloner, S. P. Armes\*, E. T. Kang, K. L. Tan and F. C. Loh, *Polymer*, 37, 2743-2749 (1996).
64. "Surface characterisation of polypyrrole latex by x-ray photoelectron spectroscopy", C. Perruchot, M. M. Chehimi\*, M. Delamar, S. F. Lascelles and S. P. Armes, *Langmuir*, 12, 3245-3251 (1996).

65. "Specific activity of polypyrrole nanoparticulate immunoreagents: comparison of surface chemistry and immobilization options", M. R. Pope, S. P. Armes and P. J. Tarcha\*, *Bioconjugate Chem.*, 7, 436-444 (1996).
66. "Neutron and X-ray reflectivity studies on water-soluble block and statistical copolymers adsorbed at the air/water interface", T.-J. Su, D. A. Styrkas, R. K. Thomas\*, F. L. Baines, N. C. Billingham and S. P. Armes, *Macromolecules*, 29, 6892-6900 (1996).
67. "Polyaniline dispersions 6: stabilization by colloidal silica particles", J. Stejskal\*, P. Kratochvil, S. P. Armes, S. F. Lascelles, A. Riede, M. Helmstadt, J. Prokes and I. Krivka, *Macromolecules*, 29, 6814-6819 (1996).
68. "Synthesis and characterisation of polypyrrole-silica-magnetite particles", M. D. Butterworth, S. A. Bell, S. P. Armes\* and A. W. Simpson, *J. Colloid Interface Sci.*, 183, 91-99 (1996).
69. "Micellization of poly(2-(dimethylamino)ethyl methacrylate-block-methyl methacrylate) copolymers in aqueous solution", F. L. Baines, S. P. Armes\*, N. C. Billingham and Z. Tuzar, *Macromolecules*, 29, 8151-8159 (1996).
70. "Synthesis and aqueous solution characterization of di-hydrophilic block copolymers of methyl vinyl ether and methyl triethylene glycol vinyl ether", C. Forder, C. S. Patrickios, S. P. Armes\*, N. C. Billingham, *Macromolecules*, 29, 8160-8169 (1996).
71. "New reactive polyelectrolyte stabilisers for polyaniline colloids", S. Maeda, D. B. Cairns and S. P. Armes\*, *Eur. Polym. J.*, 33, 245-253 (1997).
72. "Time-dependent variation of the surface energy of polypyrrole", M. M. Chehimi\*, M.-L. Abel, Z. Sahraoui, K. Fraoua, S. F. Lascelles and S. P. Armes, *Inter. J. Adhesion and Adhesives*, 17, 1-8 (1997).
73. "Water-soluble ABC triblock based on vinyl ethers: synthesis by living cationic polymerization and solution characterization", C. S. Patrickios, C. Forder, S. P. Armes\* and N. C. Billingham, *J. Polym. Sci., Polym. Chem.*, 35, 1181-1195 (1997).
74. "Micelles of polysulfobetaine-based hydrophilic-hydrophobic block copolymers", Z. Tuzar\*, H. Pospisil, J. Plestil, A. B. Lowe, F. L. Baines, S. P. Armes\* and N. C. Billingham, *Macromolecules*, 30, 2509-2512 (1997).
75. "Synthesis and aqueous solution properties of novel hydrophilic-hydrophilic block copolymers based on tertiary amine methacrylates", V. Bütün, N. C. Billingham and S. P. Armes\*, *Chem. Commun.*, 671-672 (1997).
76. "Synthesis and aqueous solution properties of novel zwitterionic block copolymers", A. B. Lowe, N. C. Billingham and S. P. Armes\*, *Chem. Comm.*, 1035-1036 (1997).
77. "Synthesis and characterisation of carboxylic acid-functionalised polypyrrole-silica micro-particles", G. P. McCarthy, S. P. Armes\*, S. J. Greaves and J. F. Watts, *Langmuir*, 13, 3686-3692 (1997).
78. "Synthesis and characterisation of micrometer-sized, polypyrrole-coated polystyrene latexes", S. F. Lascelles and S. P. Armes\*, *J. Mater. Chem.*, 7, 1339-1347 (1997).
79. "Surface characterisation of micrometer-sized, polypyrrole-coated polystyrene latexes: verification of a 'core-shell' morphology", S. F. Lascelles, S. P. Armes\*, S. Y. Luk, P. Zhdan, A. M. Brown, S. J. Greaves, S. R. Leadley and J. F. Watts, *J. Mater. Chem.*, 7, 1349-1355 (1997).

80. "Selective betainisation of tertiary amine-based methacrylate block copolymers", V. Bütün, C. E. Bennett, M. Vamvakaki, A. B. Lowe, N. C. Billingham and S. P. Armes\*, *J. Mater. Chem.*, 7, 1693-1695 (1997).
81. "Adsorption of DNA onto polypyrrole-silica nanocomposites", B. Saoudi, N. Jammul, M. M. Chehimi\*, G. P. McCarthy and S. P. Armes, *J. Colloid Interface Sci.*, 192, 269-273 (1997).
82. "Synthesis and aqueous solution characterization of di-hydrophilic block copolymers of methyl triethylene glycol vinyl ether and benzyl vinyl ether", C. Forder, C. S. Patrickios, S. P. Armes, N. C. Billingham\*, *Macromolecules*, 30, 5758-5762 (1997).
83. "First example of a conducting polymer synthesised in supercritical fluids", F. M. Kerton, G. A. Lawless and S. P. Armes\*, *J. Mater. Chem.*, 7, 1965-1966 (1997).
84. "A physicochemical study of polypyrrole-silica nanocomposites by inverse gas chromatography", C. Perruchot, M. M. Chehimi\*, M. Delamar, S. F. Lascelles and S. P. Armes, *J. Colloid Interface Sci.*, 193, 190-199 (1997).
85. "Neutron reflectivity of an adsorbed water-soluble block copolymer: a surface transition to micelle-like aggregates at the air/water interface", S. W. An, T. J. Su, R. K. Thomas\*, F. L. Baines, N. C. Billingham, S. P. Armes and J. Penfold, *J. Phys. Chem. B*, 102, 387-393 (1998).
86. "Synthesis and characterization of colloidal polypyrrole particles using reactive polymeric stabilisers", M. R. Simmons, P. A. Chaloner and S. P. Armes\*, S. J. Greaves and J. F. Watts, *Langmuir*, 14, 611-618 (1998).
87. "ABC triblock polymethacrylates: group transfer polymerisation synthesis of the ABC, ACB and BAC topological isomers and solution characterization", C. S. Patrickios, A. B. Lowe, S. P. Armes and N. C. Billingham, *J. Polym. Sci., Polym. Chem.*, 36, 617-631 (1998).
88. "Interaction of the imidazole ring with surface-anchored polypyrrole latex particles", R. B. Bjorklund, S. Maeda, S. P. Armes\* and S. Y. Luk, *J. Colloid Interface Sci.*, 197, 179-184 (1998).
89. "Synthesis of novel block and statistical methacrylate-based ionomers containing acidic, basic or betaine residues", M. Vamvakaki, N. C. Billingham and S. P. Armes\*, *Polymer*, 39, 2331-2337 (1998).
90. "Kinetics of polymerisation of aniline by  $^1\text{H}$  NMR spectroscopy", M. Gill, C. DeArmitt, S. Chapman, F. L. Baines, C. M. Dadswell, J. G. Stamper, G. A. Lawless, N. C. Billingham and S. P. Armes\*, *Synth. Met.*, 93, 227-233 (1998).
91. "Synthesis and characterisation of micrometer-sized polyaniline-coated polystyrene latexes", C. Barthet, S. F. Lascelles, H. M. E. Stanley, S. P. Armes\* and S. Y. Luk, *Langmuir*, 14, 2032-2041 (1998).
92. "Living free radical dispersion polymerization of styrene" L. I. Gabaston, R. A. Jackson and S. P. Armes\*, *Macromolecules*, 31, 2883-2888 (1998).
93. "Neutron reflectivity of an adsorbed water-soluble block copolymer at the air-water interface: the effects of pH and ionic strength", S. W. An, R. K. Thomas\*, F. L. Baines, N. C. Billingham, S. P. Armes and J. Penfold, *J. Phys. Chem. B.*, 102, 5120-5126 (1998).
94. "Surface characterization of polyaniline-coated polystyrene latexes" C. Barthet, S. P. Armes\*, C. Bilem, M. M. Chehimi and M. Omastova, *Langmuir*, 14, 5032-5038 (1998).
95. "Synthesis and characterization of zwitterionic block copolymers", A. B. Lowe, N. C. Billingham and S. P. Armes\*, *Macromolecules*, 31, 5991-5998 (1998).

96. "Near-monodisperse n-alkyl end-functionalized poly(methyl vinyl ether)s: synthesis by living cationic polymerisation and solution characterization" C. S. Patrickios, C. Forder, S. P. Armes\*, N. C. Billingham, *J. Polym. Sci., Polym. Chem.*, 36, 2547-2554 (1998).
97. "Effect of synthesis parameters on the particle size, chemical composition and conductivity of polypyrrole-silica nanocomposite particles", S. F. Lascelles, M. D. Butterworth, G. P. McCarthy and S. P. Armes\*, *Colloid Polym. Sci.*, 276, 893-902 (1998).
98. "Neutron reflectivity of adsorbed water-soluble block copolymers at the air-water interface: the effects of composition and molecular weight", S. W. An, R. K. Thomas\*, F. L. Baines, N. C. Billingham, S. P. Armes and J. Penfold, *Macromolecules*, 31, 7877-7885 (1998).
99. "Unusual aggregation behaviour of a novel tertiary amine methacrylate-based diblock copolymer: formation of micelles and reverse micelles in aqueous solution" V. Bütün, N. C. Billingham and S. P. Armes\*, *J. Am. Chem. Soc.*, 120, 11818-11819 (1998).
100. "Synthesis of shell cross-linked micelles with tunable hydrophilic/hydrophobic cores" V. Bütün, N. C. Billingham and S. P. Armes, *J. Am. Chem. Soc.*, 120, 12135-12136 (1998).
101. "Synthesis and characterization of surface-aminated polypyrrole-silica micro-particles" M. I. Goller, G. P. McCarthy, C. Barthet, R. Corradi, B. P. Newby, S. A. Wilson, S. P. Armes\* and S. Y. Luk, *Colloid Polym. Sci.*, 276, 1010-1018 (1998).
102. "Precipitation of a water-soluble ABC triblock methacrylic polyampholyte: effect of time, pH, polymer concentration, salt type and concentration, and presence of a protein", C. S. Patrickios\*, L. R. Sharma, S. P. Armes and N. C. Billingham, *Langmuir*, 15, 1613-1620 (1999).
103. "Synthesis of controlled-structure water-soluble diblock copolymers by oxyanionic polymerization" M. Vamvakaki, N. C. Billingham and S. P. Armes\*, *Macromolecules*, 32, 2088-2090 (1999).
104. "Synthesis and properties of low polydispersity poly(sulfopropylbetaines) and their block copolymers", A. B. Lowe, A. Sinanian, S. P. Armes\* and N. C. Billingham, *Macromolecules*, 32, 2141-2149 (1999).
105. "Synthesis of novel polymer-silica colloidal nanocomposites via free-radical polymerisation of vinyl monomers", C. Barthet, A. J. Hickey, D. B. Cairns and S. P. Armes\*, *Adv. Mater.*, 11, 408-410 (1999).
106. "Structure of a diblock copolymer adsorbed at the hydrophobic solid/aqueous interface: the effects of charge density on a weak polyelectrolyte brush", S. W. An, P. N. Thirtle, R. K. Thomas\*, F. L. Baines, N. C. Billingham, S. P. Armes and J. Penfold, *Macromolecules*, 32, 2731-2738 (1999).
107. "Synthesis of zwitterionic shell cross-linked micelles", V. Bütün, A. B. Lowe, N. C. Billingham and S. P. Armes\*, *J. Am. Chem. Soc.*, 121, 4288-4289 (1999).
108. "Latex syntheses using novel tertiary amine methacrylate macromonomers prepared by oxyanionic polymerization", S. F. Lascelles, F. Malet, R. Mayada, N. C. Billingham and S. P. Armes\*, *Macromolecules*, 32, 2462-2472 (1999).
109. "Synthesis and characterization of micrometer-sized, poly(3,4-ethylenedioxythiophene)-coated polystyrene latexes", M. A. Khan and S. P. Armes\*, *Langmuir*, 15, 3469-3475 (1999).
110. "Direct synthesis of novel acidic and zwitterionic block copolymers via TEMPO-mediated living free-radical polymerization", L. I. Gabaston, S. A. Furlong, R. A. Jackson and S. P. Armes\*, *Polymer*, 40, 4505-4514 (1999).

111. "Synthesis of well-defined water-soluble statistical copolymers containing pendent ethylene glycol residues", M. Vamvakaki, N. C. Billingham and S. P. Armes\*, *Polymer*, 40, 5161-5171 (1999).
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## **Invited Book Chapters**

"Potential applications of conducting polymer colloids" by S. P. Armes in "Intrinsically Conducting Polymers: An Emerging Technology", *NATO ASI Series E, Appl. Sci.*, 246, pgs. 35-43, Kluwer Press, Netherlands (1993).

"Conducting polymer colloids: a review", by S. P. Armes, pgs 207-231, in *Colloidal Polymer Particles*, ed. J. W. Goodwin and R. Buscall, Academic Press, New York (1995).

"Conducting polymer colloids", S. P. Armes, *Current Opinion in Colloid and Interface Science*, 1, 214-220, (1996).

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## **Patents and Patent Applications**

1. "Colloidal Polypyrrole", S. P. Armes and M. Aldissi, U.S. patent no. 4,959,162.
2. "Colloidal Polyaniline", S.P. Armes and M. Aldissi, U.S. patent no. 4,959,180.
3. "Non-Aqueous Polypyrrole Colloids", S.P. Armes and M. Aldissi, U.S. patent no. 5,021,193.
4. "Polymerisation de Monomeres Hydrosolubles par Polymerisation Radicalaire par Transfert D'Atomes", French patent application number AM 1519, inventors: F. Malet, S. P. Armes, D. Bertin and C. Verge, filed by Elf Atochem, France on August, 19th 1999.
5. 'Zwitterionic polymers', filed by Biocompatibles UK Ltd. WO 02/28929 A1 priority date: Oct 6th, 2000. Inventors: A. L. Lewis, S. L. Willis, S. P. Armes, E. J. Lobb, Y. Ma.
6. 'Drug carriers comprising amphiphilic block copolymers', filed by Biocompatibles UK Ltd. WO 03/074026 A1 priority date: March 7<sup>th</sup>, 2002. Inventors: A. L. Lewis, S. P. Armes, J. P. Salvage, A. P. Lloyd.
7. 'Compositions of polymers', filed by Biocompatibles UK Ltd. WO 03/074090 A2 priority date: March 7<sup>th</sup>, 2002. Inventors: A. L. Lewis and S. P. Armes
8. 'Block copolymers', filed by Biocompatibles UK Ltd. WO 04/069888A2 A2 priority date:, 2004. Inventors: A. L. Lewis and S. P. Armes
9. 'Polymer Gelator', filed by The University of Sheffield, UK WO/07/063320A1 priority date: Nov 2005. Inventors: C. Li, J. Madsen and S. P. Armes
10. 'Particle-stabilised foams', filed by The University of Sheffield, UK WO/07/060462A1 priority date: Nov 28<sup>th</sup> 2005. Inventors: A. J. Ryan, S. P. Armes, S. Fujii and P. Iddon.
11. 'Novel nanoparticles' filed by DSM Research. Priority date: Sept 6<sup>th</sup> 2006. Inventors: J. J. Yuan and S. P. Armes. PCT/EP2007/007729.
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13. 'Colloidal nanocomposite particles' filed by The University of Sheffield, UK. Priority date: May 2007. Inventors: A. Schmid and S. P. Armes.
14. 'Conducting polymer-coated thermally expandable microspheres' filed by DeBonding Ltd. Priority date: July 2008. Inventors: P. S. Bain and S. P. Armes.
15. 'Liquid marbles' filed by The University of Sheffield, UK. Priority date: Feb 2009. Inventors: D. Dupin and S. P. Armes.
16. 'Polymer Synthesis' filed by The University of Sheffield, UK. P128149GB: Priority date: March 10<sup>th</sup>, 2010. Inventors: Y. T. Li and S. P. Armes

## **Current Research Themes within the Armes Group**

### **Polymer Science**

- Polymerisation-Induced Self-Assembly (PISA)
- Water-Soluble Block Copolymers, including Polyelectrolytes
- Biocompatible Block Copolymer Micelles and Gels
- Block Copolymer Vesicles
- Polymer Brushes via Surface ATRP
- Biomineralisation: New Inorganic Particles via Block Copolymer Templates
- Stimulus-responsive Block Copolymers
- Kinetics of Micellar Self-Assembly
- Branched Copolymers
- Surface-Adsorbed Micelles and Microgels

### **Colloid Science**

- Shell Cross-Linked Micelles
- Stimulus-Responsive Microgels
- New Pickering Emulsifiers based on Organic Particles
- Sterically-Stabilised Latexes
- Colloidosomes
- Liquid Marbles
- Latex Foams
- Aqueous Dispersion Polymerisation
- Colloidal Vinyl Polymer-Silica Nanocomposites
- Conducting Polymer-Coated Latexes for Space Science Applications
- Exploitation of Analytical Techniques for Evaluation of Colloidal Particles