Curriculum vitae.

1. Personal Details

Professor Stefano Brandani, FIChemE
Chair of Chemical Engineering
Scottish Carbon Capture and Storage centre
Institute for Materials and Processes
School of Engineering, University of Edinburgh
http://www.carboncapture.eng.ed.ac.uk/
https://scholar.google.co.uk/citations?user=7-qxVd4AAAAJ&hl=en
https://www.researchgate.net/profile/Stefano_Brandani
https://www.linkedin.com/in/stefano-brandani-bb685610
ORCID: http://orcid.org/0000-0001-9470-6837
SCOPUS ID: 7005197732
Inaugural Lecture celebrating 60 years of Chemical Engineering at the University of Edinburgh:
Energy, Exergy and How We Can Achieve a Low Carbon Economy
https://www.youtube.com/watch?v=qFv6yfcMGds

2. Education/Qualifications

Diploma Liceo Scientifico, A. Bafile, L'Aquila (final score 60/60), 1986.
Laurea[1] *summa cum laude* in Chemical Engineering, University of L'Aquila, July 1991.
Enzymatic oxidation of cholesterol in supramolecular systems. (Prof. F. Alfani, Advisor)
Ph.D. in Chemical Engineering, University of Naples, January 1995.
Hyperbolic problems in chemical engineering, and determination of the physical parameters in adsorption processes. (Prof. G. Astarita, Advisor)

[1] The Laurea degree was a five year program which included a final dissertation based on a research thesis.

3. Professional History – with start and end dates.

Professor of Chemical Engineering (04/2007-).
School of Engineering
University of Edinburgh, UK.
Director of Chemical Engineering Discipline (05/2014-).
Interim Head of School (06/2012 – 02/2013)
Director of Research and Deputy Head of School (06/2010 to 06/2012)
School of Engineering
University of Edinburgh, UK.

Professor of Chemical Engineering (10/2003).
Reader in Chemical Engineering (10/2000 to 09/2003).
Senior Lecturer (10/1998 to 09/2000).
Department of Chemical Engineering
University College London, UK.

Ricercatore Confermato - Lecturer (tenured from September 1997, 09/1994 to 09/1998)
Department of Chemistry, Chemical Engineering and Materials
University of L'Aquila, Italy.

Visiting Professor, August-September 1998, September 1997.
Visiting Scholar, Fall 1995.
Deparment of Chemical Engineering
University of Maine, USA.

Visiting PhD Student, 08/1993 to 08/1994.
Deparment of Chemical Engineering
University of New Brunswick, Canada.

4. Prizes, Awards and other Honours

- The ***Philip Leverhulme Prize*** is for outstanding scholars whose work has already been recognised at international level, but who are still aged under 36. In March 2001, out of 5 awards in the field of Engineering, I was selected for the area of Chemical Engineering.
- The ***Royal Society Wolfson Research Merit Award*** is meant to attract to the UK respected scientists of outstanding achievement and potential. This award is open to any scientist, irrespective of age or current position. Out of the 7 prizes awarded in July 2001, I was the only engineer to receive this honour.
- The ***Royal Academy of Engineering Industrial Secondment*** at UOP Ltd, a Honeywell company – October 2005 to March 2006.
- ***Cavaliere dell'Ordine della Stella d'Italia***, in recognition of my contributions to scientific and technological research. Conferred by the President of Italy, Giorgio Napolitano, 2nd June 2013.
- ***ISA Senior Visiting Fellowship***, *Alma Mater Studiorum* Università di Bologna. April 2015.

5a. Other Appointments and Affiliations

- Fellow of the IChemE, UK (from 2012), Associate Member (from 2000 to 2012).
- Elected Co-Chair Area 2E (Adsorption and Ion Exchange), Separation Division, AIChE (from 2015)
- Member of the Board of the International Adsorption Society (full term 2004-2010).
- Member of the International Adsorption Society (from 1998)
- Senior Member AIChE, USA (from 2016), Member (from 2000 to 2016).
- Member of the IUPAC Task Group on Diffusion in Nanoporous Materials (#2015-002-2-100)
- Member of the British Zeolite Association (from 1999).
- Member of the Editorial Board of Adsorption (from 2007); Carbon Letters (from 2007); Diffusion Fundamentals (from 2005) – www.diffusion-fundamentals.org
- Member of the Royal Society's International Conference Grants and Short Visits (Panel 4: Engineering, Technology, Instrumentation, Materials Science, Experimental Fluid Dynamics – full term 2006-09).
- Expert Reviewer of the Intergovernmental Panel on Climate Change Special Report on Carbon Dioxide Capture and Storage (2005).

5b. Organization of International Conferences

- Member of International Organizing Committee, Thermodynamics 2017, September 2017.
- Member of Scientific Committee, International Zeolite Conference 18, June 2016.
- Member of the Technical Advisory Group (Adsorption), 13th Conference on Greenhouse Gas Control Technologies, GHGT-13, November, 2016.
- Member of Scientific Committee, 12th International Conference on Fundamentals of Adsorption, FOA11 May, 2016.
- Member of International Organizing Committee, Thermodynamics 2015, September 2015.
- Member of Scientific Committee, 11th International Conference on Fundamentals of Adsorption, FOA11 May, 2013.
- Chair Biomass Committee for the World Renewable Energy Congress - XI, September, 2010.
- Member of Scientific Committee, 10th International Conference on Fundamentals of Adsorption, FOA10 May, 2010.
- Chair Biomass Committee for the World Renewable Energy Congress - X, July, 2008.
- Chair Diffusion Fundamentals II – August 26-29, 2007.
- Member of Organizing Committee, 9th International Conference on Fundamentals of Adsorption, FOA9 May, 2007.
- Co-chair Biomass Committee for the World Renewable Energy Congress - IX, August 19-25, 2006.
- Member of the Scientific Committee, Carbon 2005, July 03-07, 2005.
- Member of the Scientific Advisory Committee, 8th International Conference on Fundamentals of Adsorption, FOA8 May 22-28, 2004.

6. Grants (Values of EPSRC grants are given at Full Economic Costing)

- EP/N033329/1 – Cation-Controlled Gating for Selective Gas Adsorption over Adaptable Zeolites. £471,024 10/2016 to 09/2019. Principal Investigator of UoE component in collaboration led by St Andrews University with the University of Bath.
- EP/N024613/1 – Versatile Adsorption Processes for the Capture of Carbon Dioxide from Industrial Sources – FlexICCS. £1,072,672 10/2016 to 09/2019. Principal Investigator Overall. Collaboration with St Andrews and UoE Chemistry (EASTChem)
- H2020 727734 – NanoMaterials Enhanced Membranes for Carbon Capture - NanoMEMC2. 651,625 Euro (4.99 M Euro Total – University of Bologna led), Co-Investigator.
- H2020 640667 – Conversion of Low Grade Heat to Power Through Closed Loop Reverse Electro-Dialysis - RED-Heat-to-Power. 402,771 Euro (4.13M Euro Total), Principal Investigator of UoE component.
- EP/N007859/1 – Multi-Scale Engineering Toolbox for Systematic Assessment of Porous Materials in the Context of Adsorption and Membrane Separations. £764,651 01/2016 to 07/2018. Co-Investigator
- ETP & Process Systems Enterprise – Modelling advanced adsorption processes for post-combustion capture. £75,000 11/2014 to 04/2018. Principal Investigator
- EP/L021064/1 – Post-Combustion Carbon Capture Using MOFs: Materials and Process Development. £200,000 01/2014 to 12/2015. Principal Investigator
- Johnson-Matthey CASE Award – Mixed Matrix Membranes for Post-Combustion Carbon Capture Applications. £92,004 09/13 to 03/17. Co-Investigator
- EP/J019720/1 – Feasibility of a Wetting Layer Adsorption Carbon Capture Process Based on Chemical Solvents. £ 826,226 10/2012 to 09/2015. Principal Investigator of UoE component in collaboration with Strathclyde University.
- EP/J02077X/1 – Adsorption Materials and Processes for Carbon Capture from Gas-Fired Power Plants – AMPGas. £ 1,372,327 09/2012 to 08/2015. Principal Investigator Overall. Collaboration with St Andrews and UoE Chemistry (EASTChem) and Heriot-Watt University.
- EP/K000446/1 – UKCCSRC - The United Kingdom Carbon Capture and Storage Research Centre. £ 10.13M 04/2012 to 03/2017. Co-Investigator. Research area champion for carbon capture using adsorption and membrane processes.
- FP7-IRSES Grant 295156 – OFFGAS – Offshore Gas Separations. 252,000 Euro – 05/2012 to 04/2016. PI Overall. Collaboration with Federal University of Ceara (Brazil) and University of Malaga (Spain).
- SFC/ERDF – SCCS a Carbon Capture and Storage Knowledge Hub for Scotland. £2M. 06/2011 to 05/2016. Co-Investigator. Collaboration with Heriot-Watt University and British Geological Survey.
- ETI & Costain – Next Generation Capture Technologies. £ 194,000 – 12/2011 to 12/2012. Principal Investigator
- Korean Institute of Energy Technology Evaluation and Planning – IGCC Integrated with an H_2 Pressure Swing Adsorption Process: £190k – 12/2011 to 11/2014. Co-Investigator.
- Industrial funding from 4 multinational companies and an equipment manufacturer – Adsorption Research Industrial Consortium. £240,000. 06/2011 to 05/2014. Principal Investigator
- EPSRC EP/I010939/1 – FOCUS - Fundamentals of Optimised Capture Using Solids. £568,237 – 01/2011 to 12/2013. Principal Investigator Overall. Collaboration with China – North China Electric Power University.
- EPSRC EP/I016686/1 – Nanotubes for Carbon Capture. Co-Investigator £201,025 – 11/2010 to 04/2012.
- Royal Society and Wolfson Foundation – Laboratory refurbishment scheme – The PoSTCap Lab for Direct Reduction in Carbon Emissions from Fossil Power Plant: £300k. Co-Investigator.
- ETP & Scottish Power – Optimisation and Integration of Membrane Processes in Coal Fired Power Plants with CCS. £70,000 01/2011 to 06/2014. Principal Investigator
- EPSRC EP/G062129/1 – Innovative Gas Separations for Carbon Capture. £2,363,660 – 11/2009 to 04/2013. PI Overall. Consortium of 6 institutions led by the University of Edinburgh with: University of St Andrews; Cardiff University; Imperial College London; University College London; University of Manchester.

- EPSRC EP/G02037X/1 Carbon Capture and Storage Interactive: CCSI – Edinburgh. £ 93,338 – 02/2009 to 01/2011. Co-Investigator.
- EPSRC EP/F034520/1 – Science and Innovation Award on Carbon Capture from Power Plant and Atmosphere. £3,557,879 – 06/2008 to 05/2013. Co-Investigator (Principal Investigator for Engineering).
- US-DoE DE-FC26-07NT43092 - Carbon Dioxide Removal from Flue Gas Using Microporous Metal Organic Frameworks – US$ 458,000 – 04/2007 to 03/2010. Principal Investigator
- EPSRC EP/E021514/1 – Chemically Modified Discriminating Gas Sensors. £407,600 – 11/2006 to 04/2010. Co-Investigator.
- EPSRC GR/R95142/01 – Diffusion in Zeolites: ZLC and TZLC Studies. £ 180,200 – 05/2003 to 09/2006. Principal Investigator
- EU Commission – Framework Programme 5 - Clean Energy from Biomass. £ 74,000 – 09/2001 to 03/2004. Co-Investigator.
- Royal Society – Royal Society Wolfson Research Merit Award - £ 300,000 – 07/2001 to 06/2006
- EPSRC GR/R06878/01 – Strategic Equipment Initiative - £ 24,000 for a quadrupole mass spectrometer. Part of a major UCL bid.
- Leverhulme Trust – Philip Leverhulme Prize - £ 50,000 – 03/2001 to 02/2004. Principal Investigator.
- Millennium Chemicals Ltd – Donation to the Centre for CO_2 Technology £ 200,000 – 2000 to 2005. Co-Investigator
- EPSRC GR/R22087/01 – Enhanced Fast Cycle Low Pressure Drop PSA. £ 60,800 – 03/2001 to 02/2003. Principal Investigator
- UCL Friends Programme - Centre for CO_2 Technology: International Seminar Series - £ 5,000 – 01/2000. Principal Investigator
- EPSRC CASE NAA Studentship – Full 3 year studentship approximately equivalent to £ 36,000 with additional contribution from BP - £ 13,500. 10/1999 to 09/2002. Principal Investigator.
- University of London, Central Research Fund - Liquid Phase Measurement of Counter-diffusion in Zeolites - £ 4,700 – 12/1998. Principal Investigator

7. Consultancies

I have acted as a consultant both on a personal basis as well as through the UoE Edinburgh Research & Innovation Ltd and UCL Consultants Ltd. Recent industrial collaborations have been with Air Liquide, Air Products, ENEL, the Energy Technologies Institute, Johnson-Matthey, UOP a Honeywell company, and the Virgin Earth Challenge.

8. Invited talks

1. *"The Zero Length Column Technique for the Measurement of Adsorption Equilibrium and Kinetic Properties of Nanoporous Materials"*, 7th FEZA Conference, July, 3-7, 2017, Sofia, Bulgaria. Invited Keynote Lecture.
2. *"The Zero Length Column Technique for the Measurement of Adsorption Equilibrium and Kinetic Properties of Nanoporous Materials"*, Johnson-Matthey Reaction and Transport Expertise Symposium, Sonning Common, UK, 20 June, 2017.
3. *"Determining the Properties of Novel Nanoporous Materials for the Evaluation of Process Performance in Carbon Capture Applications"*, VI International Workshop on Oxide-based Materials, Naples, Italy, September 21-24, 2016. Opening Plenary Lecture.
4. "*Measuring Adsorption Kinetics Using Macroscopic Techniques*", International Workshop on the Characterization of Porous Materials 7, Delray Beach, Florida USA, 5 May 2015.
5. *"The Challenge of Direct Carbon Dioxide Capture from Air"*, Climate Engineering Conference, Berlin, Germany, 21 August 2014.
6. *"Adsorption and Membrane Gas Separation Research at the University of Edinburgh"*, Invited Seminar, Quantachrome Instruments, Boynton Beach, Florida, 12 March 2014.

7. *"Adsorption and Membrane Gas Separation Research at the University of Edinburgh"*, Invited Seminar, Department of Chemical Engineering, University of Bath, UK, 25 February 2014.
8. *"Adsorption and Membrane Gas Separation Research at the University of Edinburgh"*, Invited Seminar, UOP, Des Plaines, USA, 8 November 2013.
9. *"Scottish Carbon Capture and Storage"*, Invited Plenary, Korean CCS Conference, Jeju, South Korea, 14 March, 2013. Plus associated talks at Yonsei University (12/03/13) and SK Energy (13/03/13).
10. *"Rapid Ranking of Novel Adsorbents for Carbon Capture Applications"*, Invited Plenary, PSA 2011 Conference, Edinburgh, UK, 6 September 2011.
11. *"The Challenge of Carbon Capture from Air"*, Invited Plenary, 34th Annual British Zeolite Association Conference, Edinburgh, UK, 11 April 2011.
12. *"The Zero Length Column Technique: a Versatile Experiment for the Characterisation of Equilibrium, Kinetic and Stability Properties of Nanoporous Adsorbents"*, Quantachrome Instruments, Boynton Beach, Florida, 15 November 2010.
13. *"Does CO_2 Capture from Air Make Sense?"*, IChemE – Powders: a Key-Component of Sustainable Processes, London, UK, 24 June 2010.
14. *"CO_2 Capture from the Air: Does it Make Sense?"*, Opening of Joseph Black Laboratory for CO_2 Chemistry, Edinburgh, 2 December 2009.
15. *"Novel Microporous Materials for CO_2 Capture Applications"*, NSFC-EPSRC joint Seminar on CO_2 Capture and Storage Technologies, Beijing, China 24-25 November 2009.
16. *"Carbon Capture and Storage"*, Plenary Lecture 5th Brazilian Conference on R&D in Petroleum and Gas, 21 October 2009.
17. *"Carbon Capture and Storage"* 5th International Heavy Oil Symposium, Beijing, China, 15 October 2009.
18. *"Experimental adsorption and diffusion in nanopores"* Gordon Research Conference on Nanoporous Materials, Waterville, Maine, USA on June 15-20, 2008.
19. *"Biomass Fuel & Chemicals for a Cleaner Environment"* Renewable Energy – Policy, Security, Electricity, Sustainable Transport, Water Resources/Management and the Environment, Brighton, UK, 28 November 2007.
20. *"Biomass & Biogas Technology"* Renewable Energy – Policy, Security, Electricity, Sustainable Transport, Water Resources/Management and the Environment, Brighton, UK, 28 November 2007.
21. *"Measurement of Diffusion in Zeolites?"* IRTG Workshop Diffusion in Porous media – TU-Delft, Delft, October 16-18, 2007.
22. *"Basics of the Zero Length Column (ZLC) Technique"* IRTG Workshop Diffusion in Porous media – TU-Delft, Delft, October 16-18, 2007.
23. *"Challenges in Macroscopic Measurement of Diffusion in Zeolites"*, Diffusion Fundamentals II, L'Aquila, Italy 26-29 August, 2007.
24. *"Biomass Fuel & Chemicals for a Cleaner Environment"* Renewable Energy – Policy, Security, Electricity, Sustainable Transport, Water Resources/Management and the Environment, Brighton, UK, 28 November 2006.
25. *"Biomass & Biogas Technology"* Renewable Energy – Policy, Security, Electricity, Sustainable Transport, Water Resources/Management and the Environment, Brighton, UK, 28 November 2005.
26. *"Studying Macroscopic Aspects of Measurement of Diffusion in Nanoporous Materials."*, New Horizons for Diffusion Research in Nanoporous Materials: Experiments, Theory and Application – DECHEMA Kolloquium, Frankfurt, Germany, 19 October 2006.
27. *"CFD Modelling of a Biomass Gasifier."*, Invited Lecture at the World Renewable Energy Congress IX, Florence, Italy, 23 August 2006.
28. *"The ZLC Method for Diffusion Measurements."* Invited Lecture at the 4th Pacific Basin Conference on Adsorption Science and Technology, Tianjin, China, May 22-26, 2006.
29. "*CO_2 Capture and Sequestration.*" UOP Special Lecture, Des Plaines, USA, 20 March 2006.
30. "*A New Model for the Prediction of the Behaviour of Fluidized Beds and the Interpretation of Bed Collapse Experiments.*" UOP Special Lecture, Des Plaines, USA, 16 January 2006.
31. "*Modelling the Performance of Monolith Adsorbers and Fast Cycle Processes.*" UOP Special Lecture, Des Plaines, USA, 22 November 2005.
32. "*CO_2 Capture and Sequestration*" Department of Chemical and Biological Engineering, University of Maine, USA, 4 November 2005.
33. "*The ZLC Method for Diffusion and Equilibrium Measurements.*" UOP Special Lecture, Des Plaines, USA, 28 October 2005.

34. "*Biomass Fuel & Chemicals for a Cleaner Environment*" Renewable Energy – Policy, Security, Electricity, Sustainable Transport, Water Resources/Management and the Environment, Brighton, UK, 17 October 2005.
35. "*Modelling CO_2 Adsorption in a Carbon Monolith*" Sustainable Separation Processes, London, 20 September 2005.
36. "*Characterization and Modelling of the Adsorption Properties of a Carbon Monolith*" Department of Chemical and Biomolecular Engineering, National University of Singapore, Singapore, 12 July 2005.
37. "*CO_2 Capture and Sequestration*" School of Chemical and Biomedical Engineering, Nanyang Technological University, Singapore, 11 July 2005.
38. "*Characterization and Modelling of the Adsorption Properties of a Carbon Monolith*" Korea Institute of Energy Research – KIER, Daejeon, Korea, 8 July 2005; Korea Institute of Science and Technology – KIST, Seoul, Korea, 8 July 2005.
39. "*Characterization and Modelling of the Adsorption Properties of a Carbon Monolith*" Keynote Lecture at the Carbon 2005 Conference, Gyeongju, Korea, 4 July 2005.
40. "*Hydrogen from Biomass Using Steam Gasification*" Faculty of Chemical Science and Engineering, University of Petroleum, Beijing, China 6 June 2005.
41. "*Hydrogen from Biomass Using Steam Gasification*" China-UK Symposium on Hydrogen Energy – Royal Society/Chinese Academy of Sciences, Dalian Institute of Chemical Physics, Dalian, China, 30 May 2005.
42. *"Addressing the CO_2 Emissions Problem"* AES Europe & Africa – Regional Technical Conference, 25-Jan-2005.
43. "*Measuring Diffusivities in Nanopores using the ZLC Technique*", 10th Year of GPSA. Department of Chemical Engineering, Federal University of Ceara, Fortaleza, Brazil, 23 July 2004.
44. *"The Zero Length Column: an Informative Low-Cost Technique for Diffusion Measurements in Nanoporous Materials"*, Department of Chemical Engineering, Vanderbilt University, Nashville, TN, USA, 21 May 2004.
45. *"Tracer ZLC as an Informative Low-cost Technique for Diffusion Measurements"*, Diffusion in Nanoporous Materials: from Fundamentals to Practical Issues – DECHEMA Kolloquium, Frankfurt, Germany, 15 January 2004.
46. "*Hydrogen from Biomass*", Sourcing the Hydrogen Economy – 3. London, UK, 13 January 2004.
47. *"CO_2 Capture and Sequestration Technologies"*, Invited Plenary Lecture, 10th Annual Meeting of the Chinese Society of Chemical Science and Technology – UK, London, UK, 13 September 2003.
48. *"CO_2 Capture and Sequestration Technologies"*, Environmental Management Seminars, Department of Chemical Engineering, Unversity of Maine, USA, 1 November 2002.
49. *"CO_2 Capture and Sequestration Technologies"*, Invited Plenary Lecture, Brazilian Conference of Chemical Engineering, COBEQ, Natal, Brazil, 25-28 August 2002.
50. *"CO_2 Capture and Sequestration Technologies"*, Research seminar, Department of Chemical Engineering, Federal University of Ceara, Brazil, 23 August 2002.
51. *"Macroscopic Measurement of Diffusion in Microporous Solids"*, Research seminar, School of Chemical Engineering, University of Edinburgh, UK, 26 November 2001.
52. *"Macroscopic Measurement of Diffusion in Microporous Solids"*, Research seminar, Royal Institution of Britain, London, UK, 26 October 2001.
53. "*The Linear Driving Force Model in Fast Cycle PSA Simulation*", CHE Distinguished Lecture Series, Department of Chemical Engineering, University of Maine, USA, March 30, 2001.
54. "The Centre for CO_2 Technology – Engineering Solutions to Global Warming" Special Session on CO_2 at the EAGE 62nd Conference and Technical Exhibition, Glasgow, Scotland, 29th May-2nd June, 2000.
55. "*The Zero Length Column Method*", Department of Chemical Engineering, University of Loughborough, UK, March 17, 2000.
56. "*The ZLC Method for Measuring Diffusion in Zeolites. Is it Reliable?*", Fakultat für Physik und Geowissenschaften, Universität Leipzig, Germany, November 30, 1999.
57. "*Activity Coefficient Models as Equation of State Mixing Rules*", Fall 1997 Distinguished Lecture Series, Department of Chemical Engineering, University of Maine, USA, September 19, 1997.
58. "*Solving Adsorption Diffusion Problems*", Department of Chemical Engineering, Federal University of Ceara, Fortaleza, Brazil, February 1997.

9. Academic Supervision

Past PhD students as first supervisor

1. Dr Anna Rouse – *Fast Cycle Low Pressure Drop Systems for the Separation of CO_2* – 2004.
2. Dr Parimanan Cherntongchai – *Fluidization of Fine Particles* – 2005.
3. Dr Massimiliano Nori – *Acoustic Measurement of Diffusion in Zeolites* – 2006.
4. Dr Giovanna Fiandaca – *A Multi-criteria Design Framework for the Synthesis of Complex Pressure Swing Adsorption Cycles for CO_2 Capture* – 2009.
5. Dr Xiayi Hu – *Development of the ZLC Technique for Rapid Screening of Novel Adsorbents* – 2011.
6. Dr Enzo Mangano – *Evaluation of Novel Adsorbents for Carbon Capture Applications* – 2012.
7. Dr Wenli Dang – *Development of an Automated Dual Piston Pressure Swing Adsorption System* – 2014.
8. Dr Dursun Can Ozcan – *Carbon Capture in the Cement Industry* – 2014.
9. Dr Zoe Kapetaki – *Optimisation of Adsorption and Membrane Processes for Carbon Capture* – 2014.
10. Dr Davide Bocciardo – *Optimisation and Integration of Membrane Processes in Coal Fired Power Plants with Carbon Capture and Storage.* – 2014
11. Dr Arran Gibson – *Carbon Based Adsorbents Modified using Amine Groups.* – 2016.
12. Mr Francisco Zaragoza – *Adsorption Processes for Carbon Capture Based on Circulating Fluidized Beds.* – 2017.

Current PhD students as first supervisor

- Mr Alessio Centineo – *Modelling Advanced Adsorption Processes for Post-Combustion Capture.* – 2014 start.
- Mr Roberto Mennitto – *Modelling Structured Adsorbents for Fast-Cycle Processes.* 2017 start.

Supervision of MSc and Laurea Degree students.
MSc students (note that at the University of Edinburgh the MSc in Advanced Chemical Engineering started in the academic year 2016-17)

- Ms Jinyu Wang (2017) – *Mass Transfer in Commercial Pellets.*
- Mr Roberto Mennitto (2017) – *Adsorption Kinetics from Breakthrough Experiments.*
- Mr Leung Hang Chan (2005 at UCL) – *Modelling of Zeolite Membranes for Dehydration of Alcohols and Air.*
- Ms Parimanan Cherntongchai (2000 at UCL) – *Liquid Phase ZLC Measurements of Diffusion in Zeolites.*

Laurea Degree students supervised/co-supervised:

- Antonio Della Pelle, July 1997 – final result: 110/110.
- Ida Tarquini, July 1998 – final result: 110/110 *cum laude*. Miss Tarquini received the national prize: ***"Premio Astarita" sponsored by Federchimica***, for her Laurea dissertation.
- Vittorio Gallese, April 1999 – final result: 110/110 *cum laude*.
- Massimiliano Nori, July 2001 – final result: 110/110 *cum laude*. Mr Nori carried out his research at UCL as a Socrates exchange student from the University of L'Aquila.
- Elisabetta Bruni, 2003 – Carried out her research project at UCL as a Socrates exchange student from the University of Bologna.
- Giovanna Chiara, 2003 – Carried out her research project at UCL as a Socrates exchange student from the Polytechnic of Turin.

I have supervised also various undergraduate research projects at UCL and the UoE. A particular mention goes to Mr Andrew Rees, who was short-listed as a finalist for the ***The 2001 Science, Engineering & Technology Student of the Year Awards***, for his research project on "The Sulphur-Iodine (S-I) Thermochemical Process for the Production of Hydrogen".

10. Teaching Activity

My background in Chemical Engineering is broad and has allowed me to deliver courses in a range of topics, primarily linked to the fundamentals of phase equilibria and heat and mass transfer which are at the basis of all separation processes. I have also taught Process Dynamics and Control where I have drawn from my experience in modelling the dynamics of adsorption processes. In my lectures, I have been able to introduce elements derived from my research activity and some of the experimental systems developed over the years have been adapted for use in the undergraduate teaching laboratory, both at UCL (adsorption experiment) and the University of Edinburgh (bed-collapse fluidization experiment). Through an undergraduate Summer project, I also designed a new Peltier cell experiment in 2016 which will become operational in the coming year.

Current teaching activity is on two undergraduate courses: Chemical Engineering Thermodynamics 3 and Adsorption 5 (plus the equivalent module for the MSc in Advanced Chemical Engineering).
In the past I have taught:

Introduction to Chemical Engineering – University of L'Aquila – 1992-93, 1994-96;
Final Laboratory Course – University of Maine – 1995;
Special Topics: Numerical Simulation Using gPROMS – University of Maine, USA – 1995;
Fundamentals of Separation Processes – University of L'Aquila – 1996-1998;
Analysis of Chemical Engineering Systems – University of L'Aquila – 1997-1998;
Non-Ideal Phase Equilibria (module within the Design Project Course) – UCL – 1998.
Experimentation – UCL – 1999 to 2007.
Phase Equilibria and Thermodynamic Property Prediction – UCL – 1999 to 2007.
Process Heat Transfer – UCL – 1999 to 2007.
Adsorption 5 – UoE – 2007-
Chemical Engineering Thermodynamics 3 – UoE – 2008-
Process Dynamics and Control 3 – UoE – 2010-2012
Group Coordinator for Design Project – UoE – 2008-2012
Engineering 1 – Chemical Engineering – UoE – 2014-2015

I developed the syllabus for the following courses:

Fundamentals of Separation Processes (new course introduced in the curriculum at the University of L'Aquila),
Process Heat Transfer (the course changed from a 0.25 unit to a 0.5 unit course when I joined UCL with significant redevelopment of the syllabus)
Phase Equilibria and Thermodynamic Property Prediction module (introduced in the curriculum as a result of a recommendation of the accreditation panel for the IChemE).
Adsorption 5 (new course introduced at the UoE as a result of the Royal Academy of Engineering Industrial Secondment).
Process Dynamics and Control (new module as part of Chemical Engineering in Practice 3).

11. Enabling Activity

Director of the Chemical Engineering Discipline (from 05/2014)

- Line management responsibility for 26 (29 by the end of 2017) academic members of staff. The role includes contributing to the long term planning of the School of Engineering, championing Chemical Engineering which has expanded recently in both student (to almost 520 from 280 in 2010) and staff numbers (to 29 from 12 in 2010).
- Initiating the new MSc in Advanced Chemical Engineering (2016-17 start) which allowed the recruitment of 3 additional academics into the Discipline.

Interim Head of School, School of Engineering (06/2012-02/2013).

- Overall responsibility for 88 academics and led the School preparations for the Research Excellence Framework 2014, recruiting 18 academics in 9 months. The submission to REF2014, which covered the period 1 Jan 2008 to 31 December 2013, joint with Heriot-Watt University, was ranked first in the UK for General Engineering in terms of "power", ie the product of quality and number of academics.

Director of Research and Deputy Head of School, School of Engineering (2010-2012),

- Responsible for developing the internal proposal review scheme and for approving research proposals above £ 500k. The success rate of these larger proposals reached 55% during my activity as DoR.
- Representing the School of Engineering on the College Research Committee.

Chair of the MSc in Carbon Capture and Storage Board of Examiners (from 2011-2015)
Chair of the Chemical Engineering Board of Examiners (2009-2011 and 2014-2015).
Chair of the Technical Services Committee (2009-2010 and 2016-).
Depute Director of Research for the School of Engineering, representing the School on the College Research Committee (2009-2010).
Deputy Head of Institute – Materials and Processes (2008-2009).

The following administrative duties were part of my activities while at UCL:

Chair of the Departmental Research Committee (2004-2007)

Director of the Centre for CO_2 Technology. The Centre fostered and organised:

- Links with industrial partners;
- Links with funding bodies and governmental departments;
- Multidisciplinary collaborations with other Departments and Institutes of UCL, within the general area of environmental research;
- International Seminar Series

Departmental Postgraduate Tutor (1998-2007) with responsibility for:

- Monitoring the progress of MPhil/PhD students;
- Advising MPhil/PhD students;
- Departmental contact point for and interface to the Graduate School;
- Organising the Departmental Student Seminar Series (which I initiated in 2001).

Member of the Steering Group for the Centre for Materials Chemistry (2004-2007).

Member of UCL's Academic Board (2003-2007).

Member of UCL's Research Board (2004-2007).

Departmental coordinator of the SOCRATES Student Exchange Programme (1998-2004) with responsibility for:

- Maintaining links with 14 participating Departments in 6 European countries;
- Processing incoming student application forms and advising our students interested in spending a year abroad;
- Departmental contact point for and interface to UCL's International Office and Study Abroad Office;

Representative for the Faculty of Engineering on the Language Centre Board of Management (1999-2005).

12. Research Activity.

In 1988, I began my collaboration with the Applied Thermodynamics group at the University of L'Aquila, Italy, where I studied fluid phase equilibria and developed numerical algorithms for the calculation of phase equilibria and the regression of experimental vapour-liquid, liquid-liquid, and solid-liquid data with activity coefficient models and equations of state.

In 1991, after my Laurea degree with a dissertation on *"Enzymatic oxidation of cholesterol in supramolecular systems"*, I contacted Professor Gianni Astarita of the University of Naples Federico II and began my PhD studies on Hyperbolic Models in Chemical Engineering. At the time, it was common in Italy to continue a PhD in the same University where one had carried out the Laurea degree. Therefore, I am grateful to Professor Astarita for allowing me to study, in his research group, a topic which was completely new to me and that has led to my interest in the modelling of fluidised beds and the kinetics of adsorption processes. The Italian PhD scheme allows students to spend a year of research in a foreign institution, which took me in 1993 to the University of New Brunswick, Canada, under the supervision of Professor Douglas M. Ruthven, where I developed the Tracer Zero Length Column technique to measure diffusion coefficients in zeolites.

In 1994 I began my academic career at the University of L'Aquila where I continued my collaboration with the Applied Thermodynamics and Fluidization groups and started my independent activity in the fundamentals of adsorption and adsorption processes.

In 1998 I moved to University College London where I established a research group and in 1999 I founded the Centre for CO_2 Technology with the principal focus of applying Chemical Engineering research towards reducing the carbon footprint of energy production and chemical processes.

In 2007 I joined the University of Edinburgh, which had a strong activity in CO_2 storage, and established and rapidly grew the Carbon Capture group in the School of Engineering. Through an EPSRC Science and Innovation Award I was able to recruit two academics to expand the group (Drs Ahn and Ferrari, who are now both Senior Lecturers in Chemical Engineering) and within 3 years this became the largest UK research group in the field and activity in Carbon Capture became one of the key priorities of the School of Engineering and the College of Science and Engineering.

The intense research activity has led, through the years, to a number of collaborations with internationally leading research groups. I am particularly grateful to the many colleagues in Chemistry Departments who have participated in several projects that I have led and have sent samples of many different classes of nanoporous materials for testing, including MOFs, PAFs, PIMs, micro and mesoporous carbons and zeolites, including more recently hierarchical samples.

The main results from the experimental and modelling research activities carried out so far can be summarised as:

Zero Length Column (ZLC) – Development of the Zero Length Column (ZLC) for *ranking novel nanoporous materials at mg scale for carbon capture applications*, including testing stability to SO_X and NO_X. Development of a new ZLC system for *water adsorption studies*. Development of the extended ZLC system for multicomponent tests, including breakthrough curves with less than 50 mg of sample. Evaluation of *hierarchical zeolites using the ZLC*. Establishing the controlling mass transfer mechanism of CO_2 in MOF and zeolite pellets.

Modelling Carbon Capture Processes – Detailed studies of *amine (post-combustion) and Selexol processes (pre-combustion)* to benchmark new carbon capture separation processes. Detailed simulation of the *calcium-looping process*, with particular emphasis on cement manufacture. *Membrane separations* for carbon capture applications. Biomass gasification with *two-stage adsorption PSA*.

Adsorption processes – Development of an *Adsorption Cycle Simulator, CySim.* – see http://www.carboncapture.eng.ed.ac.uk/lab/cysim. Simulation and multiobjective optimization of PSA cycles, including *hydrogen production*. Development of the Dual Piston PSA system for testing novel adsorbents – see http://www.carboncapture.eng.ed.ac.uk/lab/dual-piston-pressure-swing-adsorption-

system. Formal proof of convergence of *nested loop and Fast Ideal Adsorbed Solution algorithms and their implementation in Cysim*. Definition of the Linear Driving Force equivalent parameters for *cyclic steady state calculations of fast Pressure Swing Adsorption (PSA) cycles*. Development of accurate and *efficient numerical grids* for fast cycle PSA process simulations. Full analytical solutions of *adsorption in rectangular channels* of arbitrary aspect ratio. A detailed predictive model of adsorption processes in *monoliths*.

Diffusion in zeolites – Development of the *tracer zero length column method*, a new experimental technique for the measurement of tracer diffusivities in microporous solids. Analysis of gas and liquid phase ZLC technique with crystals and biporous solids. Heat and nonlinear equilibrium effects in ZLC measurements. Analysis of the piezometric/volumetric method which revealed a new approach to the determination of the diffusional time constants. Studies of *multicomponent diffusion* of benzene and xylenes in silicalite. Development of the *acoustic technique* for measuring diffusion in nanoporous materials. The recent research activity in this area has been carried out also in collaboration with an International Research Group, see website: http://www.uni-leipzig.de/diffusion/pages/irg.html

Fluidization – The application of the *Kotchine analysis* to the mass and momentum balance equations valid for fluidized bed systems. Extension to fluidized beds in the presence of *magnetic forces* acting upon the particles. Development of a *new model to predict fluidized bed dynamics* and implementation in a commercial CFD code. Development of a model for the correct interpretation of the *bed collapse experiment*.

Fluid phase equilibria – The development of a model for the description of vapor-liquid equilibria of the reactive mixtures containing *formaldehyde*. Thermodynamic *inconsistency of cubic equations of state* at infinite pressure. The development of advanced mixing rules, based on excess Gibbs energy formulations, *applicable to cubic and noncubic equations of state*.

12.A. List of Publications

12.A1. Books

Brandani S., Chmelik C., Kärger J. and Volpe R., Eds. **Diffusion Fundamentals II**, Leipzig University Press, Leipzig, 2007.

12.A2. Books (Chapters in)

1. Ruthven D.M. and Brandani S., **Measurement of Diffusion in Microporous Solids by Macroscopic Methods**, in J. Fraissard Ed., *Physical Adsorption: Experiment, Theory and Applications*, NATO ASI - Series C Vol. 491. Kluwer Academic Publishers, Boston, 1997. ISBN: 0-7923-4547-9.
2. Ruthven D.M., and Brandani S., **Measurement of Diffusion in Porous Solids by Zero Length Column (ZLC) Methods**, in Kanellopoulos N.K. Ed., *Recent Advances in Gas Separation by Microporous Ceramic Membranes*, Elsevier, Amsterdam, 2000. ISBN: 0-444-50272-6
3. Ruthven D.M., Brandani S. and Eic M., **Measurement of Diffusion in Microporous Solids by Macroscopic Methods**, in Karge H.G. and Weitkamp J. Eds, *Molecular Sieves – Science and Technology Volume 7*. Springer-Verlag, 2006. ISSN: 1436-8269.
4. Brandani S., **The ZLC Method for Diffusion Measurements**, in Li Z. Ed, *Adsorption – Progress in Fundamental and Application Research*. World Scientific, London, 2007. ISBN: 978-981-277-025-7
5. Brandani S., **Macroscopic Measurement of Adsorption and Diffusion in Zeolites**, in Dunne L.J. and Manos G. Eds, *Adsorption and Phase Behaviour in Nanochannels and Nanotubes*. Springer, Dordrecht, 2010. ISBN: 978-90-481-2480-0.

12.A3. Patents

1. GB2522015-A; WO2015104532-A1. Ahn H., Brandani S., Luberti M. and Lee C.H. **Hydrogen Production Process Involves Recycle Loop in Which Tail Gas Produced Downstream in the Process is Used Upstream of the Process at Shift Reactor, Providing Heat for Drying Coal and Providing Heat for Generating Carbon Dioxide**. 2015.

12.A4. Refereed articles in international journals.

1. Costenaro D., Vittoni C., Paul G., Crocell V., Gatti G., Mangano E., Brandani S., Bordiga S., Cossi M., Bisio C. and Marchese L., **CO_2 Adsorption on Different Organo-Modified SBA-15 Silicas: a Multidisciplinary Study on the Effects of Basic Surface Groups.** *Phys. Chem. Chem. Phys.*, **2017**, DOI: 10.1039/C6CP08048K
2. Sarkisov L., Centineo A. and Brandani S. **Molecular Simulation and Experiments of Water Adsorption in a High Surface Area Activated Carbon: Hysteresis, Scanning Curves and Spatial Organization of Water Clusters.** *Carbon*, **2017**, *118*, 127–138. DOI: 10.1016/j.carbon.2017.03.044
3. Gibson J.A.A., Gromov A.V., Brandani S. and Campbell EEB **Comparison of Amine-Impregnated Mesoporous Carbon with Microporous Activated Carbon and 13X Zeolite for Biogas Purification.** *Journal of Porous Materials*. DOI: 10.1007/s10934-017-0387-0
4. Brandani S., Mangano E. and Luberti M. **Net, Excess and Absolute Adsorption in Mixed Gas Adsorption**, *Adsorption*, DOI: 10.1007/s10450-017-9875-4
5. McGurk S.J., Martin C.F., Brandani S., Sweatman M.B. and Fan X., **Microwave Swing Regeneration of Aqueous Monoethanolamine for Post-Combustion CO_2 Capture**. *Applied Energy*, **2017**, *192*, 126–133. DOI: 10.1016/j.apenergy.2017.02.012
6. Ferrari M.C., Bocciardo D. and Brandani S. **Integration of Multi-Stage Membrane Carbon Capture Processes to Coal-Fired Power Plants Using Highly Permeable Polymers.** *Green Energy & Environment*, **2016**, *1*, 211–221. DOI: 10.1016/j.gee.2016.10.001
7. Martin C.F., Sweatman M.B., Brandani S. and Fan X. **Wet Impregnation of a Commercial Low Cost Silica Using DETA for a Fast Post-Combustion CO_2 Capture Process.** *Applied Energy*, **2016**, *183*, 1705–1721. DOI: 10.1016/j.apenergy.2016.09.081
8. Lozinska M.M., Mangano E., Greenaway A., Fletcher R., Thompson S.P., Murray C., Brandani S. and Wright P.A. **Cation Control of Molecular Sieving by Flexible Li-Containing Zeolite Rho.** *J. Phys. Chem. C*, **2016**, *120*, 19652-19662. DOI: 10.1021/acs.jpcc.6b04837.
9. Oreggioni G., Friedrich D., Luberti M., Ahn H. and Brandani S. **Development of an Equilibrium Theory Solver Applied to Pressure Swing Adsorption Cycles Used in Carbon Capture Processes**, *Computers and Chemical Engineering*, **2016**, *94*, 18–27. DOI: 10.1016/j.compchemeng.2016.07.020

10. Mangano E., Kahr J., Wright P.A. and Brandani S. **Accelerated Degradation of MOFs Under Flue Gas Conditions**, *Faraday Discussions*, **2016**, *192*, 181–195. DOI: 10.1039/c6fd00045b
11. Lee J.S.M., Rochelle, G., Styring P., Fennell P., Wilson G., Trusler M., Clough P., Blamey J., Dunstan M., MacDowell N., Lyth S., Yao J., Hills T., Gazzani, M., Brandl P., Anantharaman R., Brandani S., Stolaroff J., Mazzotti M., Maitland G., Muller C., Dowson G., Gibbins J., Ocone R., Campbell K.S., Erans M., Zheng L.Y., Sutter D., Armutlulu A., Smit B., **CCS - A Technology for Now: General Discussion.** *Faraday Discussions*, **2016**, *192*, 125–151. DOI: 10.1039/c6fd90052f
12. Smit B., Graham R., Styring P., Yao J., Clough P., Lee J.S.M., MacDowell N., Lyth S., Rochelle G., Hills T., Wilson G., Petit C., Kemper J., Cuellar-Franca R., Dowson G., Gazzani M., Fennell P., Sutter D., Scholes C., Azapagic A., Bell R., Gibbins J., Mazzotti M., Maitland G., Brandani S., Ocone R., Mota-Martinez M., Dunstan M., Liang P.T. Anantharaman R., Joss L., Stolaroff J., **CCS - A Technology for the Future: General Discussion,** *Faraday Discussions*, **2016**, *192*, 303–335. DOI: 10.1039/c6fd90053d
13. Wilson G., Trusler M., Yao J., Lee J.S.M., Graham R., Mac Dowell N., Cuellar-Franca R., Dowson G., Fennell P., Styring P., Gibbins J., Mazzotti M., Brandani S., Muller C., Hubble R., **End Use and Disposal of CO_2 – Storage or Utilisation? General Discussion** *Faraday Discussions*, **2016**, *192*, 561–579. DOI: 10.1039/c6fd90055k
14. Lasseuguette E., Carta M., Brandani S. and Ferrari M.C. **Effect of Humidity and Flue Gas Impurities on CO_2 Permeation of a Polymer of Intrinsic Microporosity for Post-Combustion Capture,** *International Journal of Greenhouse Gas Control*, **2016**, *50*, 93–99. DOI: 10.1016/j.ijggc.2016
15. Gibson J.A.A., Mangano E., Shiko E., Greenaway A.G., Gromov A.V., Lozinska M.M., Friedrich D., Campbell E.E.B., Wright P.A. and Brandani S. **Adsorption Materials and Processes for Carbon Capture from Gas-Fired Power Plants- AMPGas**, *Ind. Eng. Chem. Res.*, **2016,** *55*, 3840–3851. DOI: 10.1021/acs.iecr.5b05015
16. Brandani S. **A Simple Graphical Check of Consistency for Zero Length Column Desorption Curves**. *Chem. Eng. Tech.*, **2016**, *39*, 1194–1198. DOI: 10.1002/ceat.201500634
17. Brandani S., Mangano E. and Sarkisov L. **Net, Excess and Absolute Adsorption and Adsorption of Helium.**, *Adsorption*, **2016**, *22*, 261–276, DOI: 10.1007/s10450-016-9766-0
18. Ozcan D.C., Macchi A., Lu D., Kierzkowska A., Ahn H., Müller C.R. and Brandani S. **Ca-Cu Looping Process for CO_2 Capture from a Power Plant and Its Comparison with Ca-Looping, Oxy-Combustion and Amine-Based CO_2 Capture Processes,** *International Journal of Greenhouse Gas Control*, **2015**, *43*, 198–212 . DOI: 10.1016/j.ijggc.2015.10.021
19. Beck J., Friedrich D., Brandani S. and Fraga E.S. **Multi-Objective Optimisation using Surrogate Models for the Design of VPSA Systems**, *Computers and Chemical Engineering*, **2015**, *82*, 318–329. DOI: 10.1016/j.compchemeng.2015.07.009
20. Hu X., Brandani S., Benin A.I. and Willis R.R., **Development of a Semiautomated Zero Length Column Technique for Carbon Capture Applications: Rapid Capacity Ranking of Novel Adsorbents.** *Ind. Eng. Chem. Res.*, **2015,** *54*, 6772–6780. DOI: 10.1021/acs.iecr.5b00513
21. Hu X., Brandani S., Benin A.I. and Willis R.R., **Development of a Semiautomated Zero Length Column Technique for Carbon Capture Applications: Study of Diffusion Behavior of CO_2 in MOFs.** *Ind. Eng. Chem. Res.*, **2015,** *54*, 5777–5783. DOI: 10.1021/acs.iecr.5b00515
22. Abanades J.C., Arias B., Lyngfelt A., Mattisson T., Wiley D.E., Li H., Ho M.T., Mangano E., and Brandani S. **Emerging CO_2 Capture Systems,** *International Journal of Greenhouse Gas Control*, **2015**, *40*, 126-166. *Special Review Series: State of the Art – 10 years on from IPCC/SRCCS.* DOI: 10.1016/j.ijggc.2015.04.018
23. Kapetaki Z., Brandani P., Brandani S., Ahn H. **Process Simulation of a Dual-Stage Selexol Process for 95% Carbon Capture Rate at an Integrated Gasification Combined Cycle Power Plant,** *International Journal of Greenhouse Gas Control*, **2015**, *39*, 17–26. DOI:10.1016/j.ijggc.2015.04.015
24. Santori G., Luberti M. and Brandani S. **Common Tangent Plane in Mixed-Gas Adsorption.** *Fluid Phase Equilibria*, **2015**, *392*, 49–55. DOI: 10.1016/j.fluid.2015.02.017
25. Gibson J.A.A, Gromov A.V., Brandani S. and Campbell E.E.B., **The Effect of Pore Structure on the CO_2 Adsorption Efficiency of Polyamine Impregnated Porous Carbons**, *Microporous and Mesoporous Materials*, **2015**, *208*, 129–139. DOI: 10.1016/j.micromeso.2015.01.044
26. Greenaway A.G., Shin J., Cox P.A., Shiko E., Thompson S.P., Brandani S., Hong S.B., Wright P.A. **Structural Changes of Synthetic Paulingite (Na,H-ECR-18) Upon Dehydration and CO_2 Adsorption.** *Zeitschrift fur Kristallographie – Crystalline Materials*, **2015**, *230*, 223–231. DOI: 10.1515/zkri-2014-1824
27. Oreggioni G.D., Brandani S., Luberti M., Baykan Y., Friedrich D. and Ahn H., **CO_2 Capture from Syngas by an Adsorption Process at a Biomass Gasification CHP Plant: Its Comparison with Amine-based CO_2 Capture**, *International Journal of Greenhouse Gas Control*, **2015**, 35, 71–81. DOI: 10.1016/j.ijggc.2015.01.008
28. Friedrich D., Mangano E. and Brandani S. **Automatic Estimation of Kinetic and Isotherm Parameters from ZLC Experiments**. *Chem. Eng. Sci.*, **2015**, *126*, 616–624. DOI: 10.1016/j.ces.2014.12.062
29. Ruthven D.M., Farooq S. and Brandani S. **Work of Separation in CO_2 Capture: Applicability of the Value Function**. *Chem. Eng. Sci.*, **2015**, *126*, 604–607. DOI: 10.1016/j.ces.2015.01.001

30. Busciglio A., Vella G., Micale G. and Brandani S., **Modeling of Magnetic Field Assisted Fluidization: Model Development and CFD Simulation of Magnetically Stabilized Fluidized Beds.** *KONA Powder Part. J.*, **2015**, *32*, DOI: 10.14356/kona.2015012
31. Mangano E., Friedrich D. and Brandani S. **Robust Algorithms for the Solution of the Ideal Adsorbed Solution Theory Equations.** *AIChE J.*, **2015**, *61*, 981–991. DOI: 10.1002/aic.14684
32. Greenaway A.G., Santiago B.G., Donaldson P.M., Frogley M.D., Cinque G., Sotelo J., Moggach S., Shiko E., Brandani S., Howe R.F. and Wright P.A. **In situ single microcrystal gas adsorption analysis using synchrotron IR spectroscopy on the functionalised metal organic framework, $Sc_2(BDC\text{-}NH_2)_3$: A technique to analyse carbon capture sorbents.** *Angewandte Chemie*, **2014**, *53*, 13483–13487. DOI: 10.1002/anie.201408369
33. Mazzoccoli M., Bosio B., Arato E. and Brandani S. **Comparison of Equations-of-State with P-ρ-T Experimental Data of Binary Mixtures Rich in CO_2 Under the Conditions of Pipeline Transport.** *J. Supercritical Fluids*, **2014**, *95*, 474–490. DOI: 10.1016/j.supflu.2014.09.047
34. Fan X., Li X. and Brandani S., **Difference in Pore Wetting and the Wetting Measured on a Flat Surface and in an Open Space**. *Chem. Engng Sci.*, **2014**, *70*, 137–145. DOI: 10.1016/j.ces.2014.06.024.
35. Ozcan D.C., Alonso M., Ahn H., Abanades J.C. and Brandani S. **Process and Cost Analysis of a Biomass Power Plant with In-situ Calcium Looping CO_2 Capture Process.** *Ind. Eng. Chem. Res.*, **2014**, *53*, 10721–10733. DOI: 10.1021/ie500606v
36. Santori G., Franciolini M., Di Nicola G., Polonara F., Brandani S. and Stryjek R. **An Algorithm for the Regression of the UNIQUAC Interaction Parameters in Liquid-Liquid Equilibrium for Single- and Multi-Temperature Experimental Data.** *Fluid Phase Equilibria*, **2014**, *374*, 79–85. DOI: 10.1016/j.fluid.2014.04.014
37. Nori M. and Brandani S. **A model for Sound Propagation Between Two Adsorbing Microporous Plates.** *J. Acoust. Soc. Am.*, **2014**, *135*, 2634–2645. DOI: 10.1121/1.4869085
38. Santori G., Santamaria S., Sapienza A., Brandani S., Restuccia G., Freni A. **A Stand-Alone Solar Adsorption Refrigerator for Humanitarian Aid.** *Solar Energy*, **2014**, *100*, 172–178. DOI 10.1016/j.solener.2013.12.012
39. Luberti M., Friedrich D., Brandani S. and Ahn H. **Design of a H_2 PSA for Cogeneration of Ultrapure Hydrogen and Power at an Advanced Integrated Gasification Combined Cycle with Pre-Combustion Capture.** *Adsorption*, **2014**, *20*, 511–524. DOI 10.1007/s10450-013-9598-0
40. Hu X., Mangano E., Friedrich D., Ahn H. and Brandani S. **Diffusion Mechanism of CO_2 in 13X Zeolite Beads.** *Adsorption*, **2014**, *20*, 121–135. DOI: 10.1007/s10450-013-9554-z
41. Mangano E., Brandani S. and Ruthven D.M. **Analysis and Interpretation of ZLC Response Curves.** *Chemie Ingenieur Technik*, **2013**, *85*, 1714–1718. DOI: 10.1002/cite.201300083
42. Boot-Handford M., Abanades C., Anthony E., Blunt M.J., Brandani S., Mac Dowell N., Ferrari M.C., Gross R., Haszeldine S., Heptonstall P., Lyngfelt A., Makuch Z., Mangano E., Pourkashanian M., Shah N., Yao J. and Fennell P., **Carbon Capture and Storage Update.** *Energy Environ. Sci.*, **2013**. DOI: 10.1039/c3ee42350f
43. Ozcan D.C., Ahn H. and Brandani S. **Process Integration of a Ca-looping Carbon Capture Process in a Cement Plant.** *International Journal of Greenhouse Gas Control*, **2013**, *19*, 530–540. DOI: 10.1016/j.ijggc.2013.10.009
44. Banu A.M., Friedrich D., Brandani S. and Dueren T. **A Multi-Scale Study of MOFs as Adsorbents in H_2 PSA Purification.** *Ind. Eng. Chem. Res.*, **2013**, *52*, 9946–9957. DOI: 10.1021/ie4011035
45. Friedrich D., Ferrari M.C. and Brandani S. **Efficient Simulation and Acceleration of Convergence for a Dual Piston Pressure Swing Adsorption System.** *Ind. Eng. Chem. Res.*, **2013**, *52*, 8897–8905. DOI: 10.1021/ie3036349
46. Zhang K., Guan Y.J., Yao X.Y., Li Y.N., Fan X.F. and Brandani S. **Two- and Three-Dimensional Computational Studies of Liquid-Solid Fluidization**. *Powder Technology*, **2013**, *235*, 180–191. DOI: 10.1016/j.powtec.2012.09.046
47. Ahn H., Luberti M., Liu Z. and Brandani S. **Process Configuration Studies of the Amine Capture Process for Coal-Fired Power Plants**. *International Journal of Greenhouse Gas Control*, **2013**, *16*, 29–40. DOI:10.1016/j.ijggc.2013.03.002
48. Cherntongchai P. and Brandani S. **Prediction Ability of a New Minimum Bubbling Criterion.** *Advanced Powder Technology*, **2013**, *24*, 1–13. DOI:10.1016/j.apt.2012.01.001
49. Lozinska M.M., Mangano E., Mowat J.P.S., Shepherd A.M., Howe R.F., Thompson S.P., Parker J.E., Brandani S. and Wright P.A. **Understanding Carbon Dioxide Adsorption on Univalent Cation Forms of the Flexible Zeolite Rho at Conditions Relevant to Carbon Capture from Flue Gases.** *J. Am. Chem. Soc.*, **2012**, *134*, 17628–17642. DOI: 10.1021/ja3070864
50. Zhang K., Wu G.Y., Brandani S., Chen H.G., Yang Y.P. **CFD Simulation of Dynamic Characteristics in Liquid-Solid Fluidized Beds**. *Powder Technology*, **2012**, *227*, 104–110.
51. Zhang K., Pei P., Brandani S., Cheng H.G. and Yang Y.P. **CFD Simulation of Flow Pattern and Jet Penetration Depth in Gas-Fluidized Beds with Single and Double Jets**. *Chem. Engng Sci.*, **2012**, *68*, 108–119.
52. Brandani S. **Carbon Dioxide Capture from Air: a Simple Analysis**, *Energy & Environment*, **2012**, *23*, 319–328.
53. Wang H., Brandani S., Lin G. and Hu X. **Flowrate Correction for the Determination of Isotherms and Darken Thermodynamic Factors from Zero Length Column (ZLC) Experiments**, *Adsorption*, **2011**, *17*, 687–694.

54. Cherntongchai P., Innan T. and Brandani S. **Mathematical Description of Pressure Drop Profile for the 1-Valve and 2-Valve Bed Collapse Experiment,** *Chem. Engng Sci.* **2011,** *66,* 973–981.
55. Fiandaca G., Fraga E.S. and Brandani S. **A Multi-Objective Genetic Algorithm for the Design of Pressure Swing Adsorption,** *Engineering Optimization*, **2009**, *41*, 833–854.
56. Wang Q., Zhang K., Brandani S., Bi J. and Jiang J. **Scale-Up Strategy for the Jetting Fluidized Bed Using a CFD Model Based on Two-Fluid Theory,** *Canadian Journal of Chemical Engineering*, **2009**, *87*, 204–210.
57. Zhang K., Brandani S., Bi J. and Jiang J. **CFD Simulation of Fluidization Quality in Three-Dimensional Fluidized Beds,** *Progress in Natural Science*, **2008**, *18*, 729–733.
58. Wang Q., Zhang K., Sun G., Brandani S., Gao J. and Jiang J. **CFD Simulation of Fluid Dynamics in a Gas-Solid Jetting Fluidized Bed,** *International Journal of Chemical Reactor Engineering*, **2007**, *5*, Art. A112, ISSN: 1542-6580.
59. Heinke L., Chmelik C., Kortunov P., Shah D.B., Brandani S., Ruthven D.M. and Kärger J. **Analysis of Thermal Effects in Infra-Red and Interference Microscopy: n-Butane-5A and Methanol-Ferrierite Systems,** *Microporous and Mesoporous Materials*, **2007**, *104*, 18–25.
60. Brandani S. and Brandani V. **On the Properties of Equations of State at Infinite Pressure,** *AIChE J.*, **2007**, *53*, 986–988.
61. Brandani V., Gallese V. and Brandani S. **A non Cubic Equation of State for Describing the pρT Properties of Pure Components and Their Mixtures,** *Chem. Bio. Eng. Q.*, **2006**, *20*, 165–171.
62. Brandani S. and Zhang K. **A New Model for the Prediction of the Behaviour of Fluidized Beds,** *Powder Technology*, **2006**, *163*, 80–87.
63. Gunadi A. and Brandani S. **Diffusion of Linear Paraffins in NaCaA Studied by the ZLC Method,** *Microporous and Mesoporous Materials*, **2006**, *90*, 278–283.
64. Zhang K., Brandani S. and Bi J.C. **Computational Fluid Dynamics for Dense Gas-Solid Fluidized Beds,** *Progress in Natural Science*, **2005**, *15*, 42–51.
65. Ahn H. and Brandani S. **Dynamics of Carbon Dioxide Breakthrough in a Carbon Monolith Over a Wide Concentration Range,** *Adsorption*, **2005**, *11*, 473–477.
66. Nori M. and Brandani S. **A Simplified Model for Acoustic Measurement of Diffusion in Microporous Solids,** *Adsorption,* **2005**, *11*, 433–436.
67. Jobic H., Kärger J., Krause C., Brandani S., Gunadi A., Methivier A., Ehlers G., Farago B., Haeussler W. and Ruthven D.M. **Diffusivities of n-Alkanes in 5A Zeolite Measured by Neutron Spin Echo, Pulsed-Field Gradient NMR, and Zero Length Column Techniques,** *Adsorption*, **2005**, *11*, 403–407.
68. Brandani S. **On the Chromatographic Measurement of Equilibrium Isotherms Using Large Concentration Steps,** *Adsorption*, **2005**, *11*, 231–235.
69. Ahn H. and Brandani S. **A New Numerical Method for Accurate Simulation of Fast Cyclic Adsorption Processes,** *Adsorption*, **2005**, *11*, 113–122.
70. Zhang K. and Brandani S. **CFD Simulation in a Circulating Fluidized-Bed Biomass Gasifier,** *Journal of Fuel Chemistry and Technology – Ranliao Huaxue Xuebao*, **2005**, *33*, 1–5.
71. Ahn H. and Brandani S. **Analysis of Breakthrough Dynamics in Rectangular Channels of Arbitrary Aspect Ratio,** *AIChE J.*, **2005**, *51*, 1980–1990.
72. Cherntongchai P. and Brandani S. **A Model for the Interpretation of the Bed Collapse Experiment,** *Powder Technology*, **2005**, *151*, 37–43.
73. Zhang K. and Brandani S. **A CFD model for fluid dynamics in a gas-fluidised bed,** *Chem. Res. Chinese Univ.*, **2004**, *20*, 483–488.
74. Brandani S. and Brandani V. **Extension of Generalised Mixing Rules to Cubic Equations of State,** *J. Chem. Thermodynamics*, **2004**, *36*, 949–956.
75. Brandani F., Rouse A., Brandani S. and Ruthven D.M. **Adsorption Kinetics and Dynamic Behavior of a Carbon Monolith,** *Adsorption*, **2004**, *10*, 99–109.
76. Cherntongchai P. and Brandani S. **Liquid Phase Counter-Diffusion Measurements of Aromatics in Silicalite Using the ZLC Method,** *Adsorption*, **2003**, *9*, 197–204.
77. Brandani S. **Comments on "An Analytical Solution for the Analysis of Zero-Length-Column Experiments with Heat Effects",** *Ind. Eng. Chem. Res.*, **2003**, *42*, 2033.
78. Lettieri P., Brandani S., Yates J.G. and Newton D., **A Generalization of the Foscolo and Gibilaro Particle-Bed Model to Predict the Fluid Bed Stability of Some Fresh FCC Catalysts at Elevated Temperatures,** *Chem. Engng Sci.*, **2001**, *56,* 5401–5412.
79. Brandani S., Jama M. and Ruthven D.M., **Diffusion, Self-Diffusion and Counter-Diffusion of Benzene and p-Xylene in Silicalite,** *Microporous and Mesoporous Materials*, **2000**, *35-36*, 283–300.
80. Brandani S., Jama M. and Ruthven D.M., **Effect of Isotherm Non-Linearity on ZLC Experiments,** *Chem. Engng Sci.*, **2000**, *55*, 1205–1212.
81. Brandani S., Jama M. and Ruthven D.M., **Counterdiffusion of p-Xylene/Benzene and p-Xylene/o-Xylene in Silicalite Studied by the Zero-Length Column Technique,** *Ind. Eng. Chem. Res.*, **2000**, *39*, 821–828.
82. Brandani S. and Ruthven D.M. **Comments on Bridging the Gap between Macroscopic and NMR Diffusivities,** *Chem. Engng Sci.*, **2000**, *55*, 1935–1937.

83. MacDougall H., Ruthven D.M. and Brandani S., **Sorption and Diffusion of SF6 in Silicalite Crystals,** *Adsorption*, **1999**, *5*, 369–372.
84. Brandani S., Austin K. and Ruthven D.M., **The Flow Pattern and Residence Time Distribution for an Endless Belt Solid-Liquid Contactor,** *Chem. Engng Sci.*, **1999**, *54*, 417–432.
85. Boulicaut L., Brandani S. and Ruthven D.M., **Liquid Phase Sorption of Branched and Cyclic Hydrocarbons in Silicalite,** *Microporous and Mesoporous Materials*, **1998**, *25*, 81–93.
86. Brandani S., Cavalcante C.L., Guimaraes A.M. and Ruthven D.M., **Heat Effects in ZLC Experiments,** *Adsorption*, **1998**, *4*, 275–285.
87. Brandani S., Brandani V. and Vegliò F., **On the Purification of β-naphtalensulfonic Acid from Dilute Aqueous Solutions Containing Sulfuric Acid,** *Ind. Eng. Chem. Res.*, **1998**, *37*, 4528–4530.
88. Brandani S., **Effect of nonlinear equilibrium on ZLC experiments,** *Chem. Engng Sci.*, **1998**, *53*, 2791–2798.
89. Brandani S., Brandani V. and Tarquini I., **Vapor-Liquid Equilibrium of Formaldehyde Mixtures Containing Methanol,** *Ind. Eng. Chem. Res.*, **1998**, *37*, 3485–3489.
90. Brandani F., Brandani S. and Brandani V., **EOS Mixing Rules which Incorporate the Residual UNIQUAC model,** *Ind. Eng. Chem. Res.*, **1998**, *37*, 2929–2935.
91. Sergeev Y.A., Gibilaro L.G., Foscolo P.U. and Brandani S., **The Speed Direction and Stability of Concentration Shocks in a Fluidised Bed,** *Chem. Engng Sci.*, **1998**, *53*, 1233–1238.
92. Brandani F., Brandani S. and Brandani V., **Simple New EOS Mixing Rules which Incorporate Lattice Fluid Excess Functions,** *Chem. Engng Sci.*, **1998**, *53*, 1041–1047.
93. Brandani F., Brandani S. and Brandani V., **The Wong-Sandler Mixing Rules and EOS which are Thermodynamically Consistent at Infinite Pressure,** *Chem. Engng Sci.*, **1998**, *53*, 853–856.
94. Brandani S., Brandani V. and Vegliò F., **Extraction of Anions from Aqueous Solutions Using Secondary Amines,** *Ind. Eng. Chem. Res.*, **1998**, *37*, 292–295.
95. Brandani S., **Analysis of the Piezometric Method for the Study of Diffusion in Microporous Solids: Isothermal Case,** *Adsorption*, **1998**, *4*, 17–24. DOI 10.1023/A:1008831202564
96. Gabai D.B., dos Santos N.A.A., Azevedo D.C.S., Brandani S. and Cavalcante C.L., **Removal of Copper Electrolyte Contaminants by Adsorption,** *Brazilian J. Chem. Eng.*, **1997**, *14*, 199–208.
97. Cavalcante C.L., Brandani S. and Ruthven D.M., **Evaluation of the Main Diffusion Path in Zeolites from ZLC Desorption Curves,** *Zeolites*, **1997**, *18*, 282–285.
98. Brandani S., Ruthven D.M. and Kärger J., **Diffusion in a Unidimensional Zeolite Pore System: Propane in $ALPO_4$–5,** *Microporous Materials*, **1997**, *8*, 193–200.
99. Brandani S., Xu Z. and Ruthven D.M., **Transport Diffusion and Self–Diffusion of Benzene in NaX and CaX Zeolite Crystals Studied by ZLC and Tracer ZLC Techniques,** *Microporous Materials*, **1996**, *7*, 323–331.
100. Brandani S., Rapagna S., Foscolo P.U. and Gibilaro L.G., **Jump Conditions for One–Dimensional Two–Phase Shock Waves in Fluidised Beds: the Effect of the Jump in Fluid Pressure,** *Chem. Engng Sci.*, **1996**, *51*, 4638–4647.
101. Brandani S. and Astarita G., **Analysis of the Discontinuities in Magnetized–Bubbling Fluidized Beds,** *Chem. Engng Sci.*, **1996**, *51*, 4631–4637.
102. Brandani S. and Brandani V., **On the Inapplicability of Mixing Rules Based on the Infinite Pressure Reference State for Equations of State which Use the Repulsive Hard–Sphere Term,** *Fluid Phase Equilibria*, **1996**, *121*, 179–184.
103. Brandani S., **An Equation for the Mean Square Displacement in Single File Diffusion,** *J. Catal.*, **1996**, *160*, 326–327.
104. Brandani S. and Ruthven D.M., **Analysis of ZLC Desorption Curves for Gaseous Systems,** *Adsorption*, **1996**, *2*, 133–143.
105. Brandani S., **Analytical Solution of ZLC Desorption Curves for Biporous Adsorbents,** *Chem. Engng Sci.*, **1996**, *51*, 3283–3288.
106. Brandani S. and Brandani V., **Vapor-Liquid Equilibrium Calculation of the System Water-Nitric Acid,** *Fluid Phase Equilibria*, **1996**, *114*, 37–45.
107. Brandani S. and Ruthven D.M., **Moments Analysis of ZLC Desorption Curves,** *Ind. Eng. Chem. Res.*, **1996**, *35*, 315–319.
108. Brandani S., Brandani V., Di Giacomo G. and Spera L., **Effect of Nonlinear Equilibrium on the Mass Transfer Rate of α–Amylase Extraction by Reversed Micelles,** *Process Biochem*, **1996**, *31*, 249–252.
109. Brandani S., Hufton J.R. and Ruthven D.M., **Self-Diffusion of Propane and Propylene in 5A and 13X Zeolite Crystals Studied by the Tracer ZLC Method,** *Zeolites*, **1995**, *15*, 624–631.
110. Brandani S., Ruthven D.M. and Kärger J., **Concentration Dependence of Self-Diffusivity of Methanol in NaX Zeolite Crystals,** *Zeolites*, **1995**, *15*, 494–495.
111. Brandani S., **Author's Reply to Comments by F. Ruiz and V. Gomis,** *Chem. Engng Sci.*, **1995**, *50*, 1511.
112. Brandani S. and Ruthven D.M., **Analysis of ZLC Desorption Curves for Liquid Systems,** *Chem. Engng Sci.*, **1995**, *50*, 2055–2059.

113. Brandani S., Brandani V., Di Giacomo G. and Spera L., **A Thermodynamic Model for Protein Partitioning in Reversed Micellar Systems**, *Chem. Engng Sci.*, **1994**, *49*, 3681–3686.
114. Brandani S., **An Algorithm for Ternary Liquid-Liquid Equilibria Calculation to Be Applied in Experimental Data Regression**, *Chem. Biochem. Eng. Q.* **1994**, *8*, 163–166.
115. Brandani S., **A Vapor Pressure Correlation for Polar Substances Based on Four Parameter Corresponding States**, *Chem. Eng. J.*, **1994**, *55*, 139–141.
116. Brandani S., Brandani V. and Di Giacomo G., **Extended Pitzer Model for 1-1 Electrolyte Solutions: Ranges of Applicability from a Study of the System Water Nitric Acid**, *Chem. Biochem. Eng. Q.*, **1994**, *8*, 125–127.
117. Brandani S., Brandani V., Di Giacomo G. and Boattini P.P., **Solubility of Acetylacetonates of Chromium and Iron in Mixed Organic Solvents**, *La Gazz. Chimica* **1994**, *124*, 295–297.
118. Di Giacomo G., Brandani S., Brandani V. and Del Re G., **High Pressure Phase Equilibria of the System Phenol–m-Cresol–Carbon Dioxide**, *Fluid Phase Equilibria* **1994**, *95*, 313–327.
119. Brandani S., **The Relevance of Binodal Curve Data in Ternary Liquid–Liquid Equilibria** *Chem. Engng Sci.*, **1994**, *49*, 1469–1471.
120. Brandani S. and Brandani V., **Isothermal Vapor–Liquid Equilibria and Solubility in the System Methanol + 1,3,5-Trioxane**, *J. Chem. Eng. Data* **1994**, *39*, 203–204.
121. Brandani S., Brandani V., Del Re G. and Di Giacomo G., **Liquid-Liquid Equilibria of the Ternary System Water/2-Butyloxyethanol/n-Decane at Three Different Temperatures**, *Fluid Phase Equilibria* **1994**, *94*, 313–320.
122. Brandani S., Brandani V. and Flammini D., **Solubility of Trioxane in Water**, *J. Chem. Eng. Data* **1994**, *39*, 201–202.
123. Brandani S. and Foscolo P.U., **Analysis of Discontinuities Arising from the One-Dimensional Equations of Change for Fluidization**, *Chem. Engng Sci.*, **1994**, *49*, 611-619.
124. Brandani P., Brandani S., Brandani V. and Del Re G., **Equation of State for Mixtures Containing Polar Compounds**, *Chem. Engng Sci.*, **1994**, *49*, 517–522.
125. Brandani S., Brandani V. and Di Giacomo G., **Vapor-Liquid Equilibrium Calculation of the System Water-Hydrogen Chloride**, *Fluid Phase Equilibria* **1994**, *92*, 67–74.
126. Brandani S., Brandani V. and Flammini D., **Isothermal Vapor-Liquid Equilibria for the Water-1,3,5–Trioxane System**, *J. Chem. Eng. Data* **1994**, *39*, 184–185.
127. Brandani S., **A Generalized Vapor Pressure Correlation for Nonpolar Substances Based on Three Parameter Corresponding States**, *Ind. Eng. Chem. Res.* **1993**, *32*,756–758.
128. Brandani S., Brandani V. and Di Giacomo G., **The System Formaldehyde-Water-Methanol: Thermodynamics of Solvated and Associated Solutions**, *Ind. Eng. Chem. Res.* **1992**, *31*, 1792–1798.
129. Brandani S., Brandani V. and Di Giacomo G., **Correlation for the Infinite-Dilution Activity Coefficients of One Binary Component from the Other**, *Ind. Eng. Chem. Res.* **1992**, *31*, 420–424.
130. Brandani S., Brandani V. and Di Giacomo G., **Vapor-Liquid Equilibrium of Water Trioxane-Formaldehyde Mixture**, *Fluid Phase Equilibria* **1991**, *63*, 27–41.
131. Brandani S., Brandani V. and Di Giacomo G., **A Physical Theory Superimposed onto the Chemical Theory for Describing Vapor-Liquid Equilibria of Binary Systems of Formaldehyde in Active Solvents**, *Ind. Eng. Chem. Res.* **1991**, *30*, 414–420.
132. Brandani S., Brandani V., Del Re G. and Di Giacomo G., **Activity Coefficients from a Virial Expansion About Their Infinite-Dilution Values**, *Chem. Eng. J.* **1991**, *46*, 35–42.

12.A5. Refereed articles in international conference proceedings.

133. Brandani S. **Determining the Properties of Novel Nanoporous Materials for the Evaluation of Process Performance in Carbon Capture Applications.** *Advanced Science Letters*, **2017**,
134. Oreggioni G.D., Friedrich D., Brandani S. and Ahn H. **Techno-Economic Study of Adsorption Processes for Pre-Combustion Carbon Capture at a Biomass CHP Plant.** *Energy Procedia,* **2014**, *63*, 6738–6744. DOI: 10.1016/j.egypro.2014.11.709
135. Ozcan D.C., Brandani S. and Ahn H. **A Hybrid Carbon Capture System of Indirect Calcination and Amine Absorption for a Cement Plant.** *Energy Procedia,* **2014**, *63*, 6428–6439. DOI: 10.1016/j.egypro.2014.11.678
136. Luberti M., Friedrich D., Ozcan D.C., Brandani S. and Ahn H. **Novel Strategy to Produce Ultrapure Hydrogen from Coal with Pre-combustion Carbon Capture.** *Energy Procedia,* **2014**, *63*, 2023–2030. DOI: 10.1016/j.egypro.2014.11.217
137. Ahn H., Kapetaki Z., Brandani P. and Brandani S. **Process Simulation of a Dual-Stage Selexol Unit for Pre-Combustion Carbon Capture at an IGCC Power Plant.** *Energy Procedia,* **2014**, *63*, 1751–1755. DOI: 10.1016/j.egypro.2014.11.182

138. Lasseuguette E., Ferrari M.C. and Brandani S. **Humidity Impact on the Gas Permeability of PIM-1 Membrane for Post-combustion Application.** *Energy Procedia,* **2014**, *63*, 194–201. DOI: 10.1016/j.egypro.2014.11.020
139. Bryan N., Lasseuguette E., van Dalen M., Permogorov N., Amieiro A., Brandani S. and Ferrari M.C. **Development of Mixed Matrix Membranes Containing Zeolites for Post-combustion Carbon Capture.** *Energy Procedia,* **2014**, *63*, 160–166. DOI: 10.1016/j.egypro.2014.11.016
140. Kapetaki Z., Ahn H. and Brandani S. **Detailed Process Simulation of Pre-Combustion IGCC Plants using Coal-Slurry and Dry Coal Gasifiers.** *Energy Procedia,* **2013**, *37*, 2196–2203. DOI: 10.1016/j.egypro.2013.06.099
141. Ahn H., Luberti M., Liu Z. and Brandani S. **Process simulation of aqueous MEA plants for post-combustion capture from coal-fired power plants.** *Energy Procedia,* **2013**, *37*, 1523–1531. DOI: 10.1016/j.egypro.2013.06.028
142. Bocciardo D., Ferrari M.C. and Brandani S. **Modelling and Multi-Stage Design of Membrane Processes Applied to Carbon Capture in Coal-Fired Power Plants.** *Energy Procedia,* **2013**, *37*, 932–940. DOI: 10.1016/j.egypro.2013.05.188
143. Romano M.C., Martinez I., Murillo R., Arstad B., Blom R., Ozcan D.C., Ahn H. and Brandani S. **Process Simulation of Ca-looping Processes: Review and Guidelines.** *Energy Procedia,* **2013**, *37*, 142–150. DOI: 10.1016/j.egypro.2013.05.095
144. Dang W., Friedrich D. and Brandani S. **Characterisation of an Automated Dual Piston Pressure Swing Adsorption (DP-PSA) System.** *Energy Procedia,* **2013**, *37*, 57–64. DOI: 10.1016/j.egypro.2013.05.085
145. Mangano E., Brandani S., Ferrari M.C., Ahn H., Friedrich D., Lozinska M.L., Wright P.A., Kahr J., Morris R., Croad M., McKeown N., Shamsipour H. and Budd P. **Efficient and Rapid Screening of Novel Adsorbents for Carbon Capture in the UK IGSCC Project.** *Energy Procedia,* **2013**, *37*, 40–47. DOI: 10.1016/j.egypro.2013.05.083
146. Beck J., Friedrich D., Brandani S., Guillas S. and Fraga E.S. **Surrogate Based Optimisation for Design of Pressure Swing Adsorption Systems,** *22ND EUROPEAN SYMPOSIUM ON COMPUTER AIDED PROCESS ENGINEERING Book Series: Computer-Aided Chemical Engineering* , **2012,** *30*, 1217–1221.
147. Fiandaca G., Fraga E.S. and Brandani S. **Development of a Flowsheet Design Framework of Multi-Step PSA Cycles for CO_2 Capture** *10TH INTERNATIONAL SYMPOSIUM ON PROCESS SYSTEMS ENGINEERING: PART A Book Series: Computer-Aided Chemical Engineering* , **2009,** *27*, 849–854.
148. Fiandaca G., Fraga E.S. and Brandani S. **Multicriteria Design Framework for CO_2 capture by Multi-Step PSA Cycles,** *19TH EUROPEAN SYMPOSIUM ON COMPUTER AIDED PROCESS ENGINEERING Book Series: Computer-Aided Chemical Engineering* , **2009,** *26*, 603–608.
149. Zhang K. Pei P. and Brandani S. **A Model Based on Two-Fluid Theory for Predicting Hydrodynamic Behavior in 3D Fluidized Beds: II. Fluid Dynamics of Liquid-Solid Systems,** *Journal of Chemical Industry and Engineering (China),* **2008**, *59*, 1100–1106.
150. Zhang K. and Brandani S. **A Model Based on Two-Fluid Theory for Predicting Hydrodynamic Behavior in 3D Fluidized Beds: I. Homogeneous and Bubbling Fluidization of Gas-Solid Systems,** *Journal of Chemical Industry and Engineering (China),* **2008**, *59*, 1091–1099.
151. Nori M. and Brandani S. **A Model for Sound Propagation in the Presence of Microporous Solids,** in W.C. Conner and J. Fraissard (Eds.), *Fluid Transport in Nanoporous Materials*, 629–637, Springer, Amsterdam, 2006.
152. Di Federico G., Camplone I., Brandani S. and Barker J. **Coal Characterization for Carbon Dioxide Sequestration Purposes,** in W.C. Conner and J. Fraissard (Eds.), *Fluid Transport in Nanoporous Materials*, 583–590, Springer, Amsterdam, 2006.
153. Di Federico G. and Brandani S. **A Procedure for the Calculation of CO_2 Sequestration Capacity in Coal Beds,** *Chemical Engineering Transactions*, **2005**, *7*, 547–552.
154. Brandani F., Brandani S., Coe C.G. and Ruthven D.M. **Measurement of Henry Constants and Equilibrium Isotherms by the ZLC Technique,** in K. Kaneko, H. Kanoh and Y. Hanzawa, Eds *Fundamentals of Adsorption 7*, 21-28, IK International, Chiba, Japan, 2002.
155. Rouse A.J. and Brandani S. **Modelling a Dual Piston Pressure Swing Adsorption System,** In AIChE Separation Technology Topical Conference Vol. 2, P. Bryan and A. Serbezov Eds., 2001, p 833–838.
156. Rouse A.J. and Brandani S. **A New LDF Approximation for Cyclic Adsorption Processes,** In AIChE Separation Technology Topical Conference Vol. 2, P. Bryan and A. Serbezov Eds., 2001, p 739–743.
157. Brandani S., **Effect of Nonlinear Equilibrium on the ZLC Method for Measuring Diffusion in Microporous Solids,** in F. Meunier, Ed. *Fundamentals of Adsorption 6*, 1225–1230, Elsevier, Amsterdam, 1998.
158. Gabai D.B., Azevedo D.C.S., dos Santos N.A.A., Brandani S., Cavalcante C.L., **Removal of Antimony and Bismuth Impurities from Copper Electrolyte by Resins,** in F. Meunier, Ed. *Fundamentals of Adsorption 6*, 1017–1022, Elsevier, Amsterdam, 1998.
159. Brandani S., Austin K. and Ruthven D.M., **The Flow Pattern and Residence Time Distribution for an Endless Belt Solid-Liquid Contactor,** in F. Meunier, Ed. *Fundamentals of Adsorption 6*, 357–363, Elsevier, Amsterdam, 1998.

160. Brandani F., Brandani S. and Brandani V., **Inapplicability of the Wong–Sandler Mixing Rules to Non–Cubic Equations of State**, *AIDIC Conference Series*, **1997**, *3*, 53–57.
161. Brandani S., **The Zero Length Column Method: Current Status**, *AIDIC Conference Series*, **1995**, *1*, 19–28.
162. Hufton J.R., Brandani S. and Ruthven D.M., **Measurement of Intracrystalline Diffusion by Zero Length Column Tracer Exchange**, in J. Weitkamp, H.G. Karge, H. Pfeifer and W. Holderich Eds *Zeolites and Related Microporous Materials: State of the Art 1994*, Studies in Surface Science and Catalysis, Vol. 84, 1323–1330, Elsevier, Amsterdam 1994.
163. Alfani F., Brandani S., Cantarella M. and Savelli G., **Stability and Activity of Cholesterol Oxidase in Supramolecular Systems**, in *Biocatalysis in Non-Conventional Media*, J. Tramper et al., ed; Elsevier: Amsterdam, 1992.

12.A6. Other publications

1. Brandani S., Brandani V., Del Re G. and Di Giacomo G., "*Activity Coefficients from a Virial Expansion About Their Infinite-Dilution Values*", 4th International Conference on Thermodynamics of Solution of Non-Electrolytes, Santiago de Compostela, September 24-29, 1989.
2. Brandani S., Brandani V., Di Giacomo G., "*A Physical Theory Superimposed onto the Chemical Theory for Describing Vapor-Liquid Equilibria of Binary Systems of Formaldehyde in Active Solvents*", 11th IUPAC Conference on Chemical Thermodynamics, Como, August 26-31, 1990.
3. Alfani F., Brandani S., Cantarella M., Savelli G., "*The Kinetics of Cholesterol Oxidase in Supramolecular Systems*", Fundamentals of Biocatalysis in Non-Conventional Media, Noordwijkerhout, The Netherlands, April 26-29, 1992.
4. Brandani S., "*Vapor-Liquid Equilibria of Formaldehyde Solutions in Chemically Reactive Solvents*", Chemical Engineering Forum for Young Scientists (in connection with ISCRE 12), Turin, Italy, July 2-4, 1992.
5. Brandani S., Brandani V., Di Giacomo G., "*Extended Pitzer Model for 1-1 Electrolyte Solutions: Application to Vapor Pressure of the System Water-Nitric Acid*", Chemical and Process Engineering (AIDIC), Florence, Italy, May 13-15, 1993.
6. Brandani S., "*A Vapor Pressure Correlation for Polar Substances Based on Four Parameter Corresponding States*", Chemical and Process Engineering (AIDIC), Florence, Italy, May 13-15, 1993.
7. Brandani S., "*Application of Kotchine Analysis to Hyperbolic Models in Chemical Engineering*", Departement of Chemical Engineering, University of New Brunswick, Cananda, October 14, 1993.
8. Hufton J.R., Brandani S., Ruthven D.M., "*Measurement of Intracrystalline Diffusion by Zero Length Column Tracer Exchange*", 10th International Zeolite Conference, Garmisch-Partenkirchen, Germany, July 17-22, 1994.
9. Brandani S., Chen Z., Rapagna S., Foscolo P.U., "*Analisi Lineare e non-Lineare della Propagazione di Perturbazioni in Sistemi Fluidizzati: il Campo di Pressione non Stazionario*", IV Convegno Internazionale di Fluidodinamica Multifase Nell'Impiantistica Industriale, Ancona, Italy, October 6-7, 1994.
10. Brandani S., Rapagna S., Foscolo P.U., Gibilaro L.G., "*The Unsteady-State Pressure Field in Fluidized Suspensions: Effect on the Jump Conditions for One-Dimensional Shock Waves*", 2nd International Conference on Multiphase Flow, Kyoto, Japan, April 3–7, 1995.
11. Brandani S., Brandani V., *"A New Model for 1–1 Electrolyte Solutions Applicable over the Entire Concentration Range*", 2nd International Conference on Chemical and Process Engineering (AIDIC), Florence, Italy, May 15-17, 1995.
12. Brandani S., "*The Zero Length Column Method: Current Status*", 2nd International Conference on Chemical and Process Engineering (AIDIC), Firenze, Italy, May 15-17, 1995.
13. Brandani S., Astarita G., "*Analysis of the Propagation of Discontinuities in Magnetized–Fluidized Beds*", 2nd International Conference on Chemical and Process Engineering (AIDIC), Florence, Italy, May 15-17, 1995.
14. Brandani S., Rapagna S., Foscolo P.U., Gibilaro L.G., "*Jump Conditions for One–Dimensional Two–Phase Shock Waves in Fluidised Beds: the Effect of the Jump in Fluid Pressure*", Fluid Particle Interactions IV, Davos, Switzerland, May 12–17, 1996.
15. Ruthven D.M., Brandani S., "*Measurement of Diffusion in Microporous Solids by Macroscopic Methods*", NATO ASI, La Colle sur Loup, France, May 19–31, 1996.
16. Brandani F., Brandani S., Brandani V., "*Inapplicability of the Wong–Sandler Mixing Rules to Non–Cubic Equations of State*", ECCE–1, Florence, Italy, May 4–7, 1997.
17. Vegliò F., Ciciotti V., Brandani S., Brandani V., "*Liquid-Liquid Extraction of Anions by Amberlite LA2: Purification of Naphtalensulphonic Acid as Upstream Process for a Fine Chemical Microbiological Process*", ECCE–1, Florence, Italy, May 4–7, 1997.
18. Austin K., Brandani S., Ruthven D.M. "*Hydrodynamics and Mass Transfer Characteristics of a Continuous Countercurrent Adsorber*", Fundamentals of Adsorption 6, Giens, France, May 24–28, 1998.
19. Gabai D.B., Azevedo D.C.S., dos Santos N.A.A., Brandani S., Cavalcante C.L., "*Removal of Antimony and Bismuth Impurities from Copper Electrolyte by Resins*", Fundamentals of Adsorption 6, Giens, France, May 24–28, 1998.
20. Brandani S., "*Effect of Nonlinear Equilibrium on the ZLC Method for Measuring Diffusion in Microporous Solids*", Fundamentals of Adsorption 6, Giens, France, May 24–28, 1998.

21. Brandani F., Brandani V. and Brandani S. "*Extension of Generalised Mixing Rules to Cubic EOS*", Thermodynamics 99, London, UK, April 14–16, 1999.
22. Brandani F., Brandani V. and Brandani S. "*Extension of the Brandani Mixing Rules to Cubic EOS*", ICheaP-4, Florence, Italy, May 2–5, 1999.
23. Brandani S. and Ruthven D.M., *"Re-Opening the Gap between Macroscopic and NMR Diffusion Measurements*", British Zeolite Association Meeting, Edinburgh, UK, August 8-13, 1999.
24. Rouse A.J. and Brandani S. "*Enhanced Fast Cycle Low Pressure Drop Systems for Separation of CO_2*". RSC Annual Conference 2000 – "Towards Sustainability", UMIST, Manchester, UK, 17-20 April 2000.
25. Simons S.J.R. and Bradani S. "*The Centre for CO_2 Technology at UCL – Engineering Solutions to Global Warming*", EAGE 62nd Conference. Glasgow, Scotland, 29 May - 2 June 2000.
26. Cherntongchai P. and Brandani S. "*Liquid Phase Counter-Diffusion Measurements of Xylenes in Silicalite Using the ZLC Method*", AIChE 2000 Annual Meeting, Los Angeles, USA, November 12-17, 2000.
27. Rouse A.J. and Brandani S., *"Efficient Modelling of Fast Cycle Adsorption for the Separation of CO_2"*, First National Conference on Carbon Sequestration, Washington, DC May 14-17, 2001.
28. Brandani F., Brandani S., Ruthven D.M. and Coe C.G. "*Measurement of Henry Constants for Zeolite Adsorbents by the ZLC Method*", Fundamentals of Adsorption 7, May 21-25, 2001.
29. Rouse A.J. and Brandani S. "*The LDF Approximation in Fast Cyclic Adsorption Processes*", Fundamentals of Adsorption 7, May 21-25, 2001.
30. Cherntongchai P. and Brandani S. "*Liquid Phase Counter-Diffusion Measurements of Xylenes in Silicalite Using the ZLC Method*", Fundamentals of Adsorption 7, Nagasaki, Japan, May 21-25, 2001.
31. K. Zhang, S. Brandani and J.G. Yates "*A Model for the Prediction of Fluidized Bed Behaviour*", Fluid-Particle Interactions VI, Barga, Italy, August 25-30, 2002.
32. Brandani S. *"CO_2 Capture and Sequestration Technologies"*, Invited Pleanary Lecture, Brazilian Conference of Chemical Engineering, COBEQ, Natal, Brazil, 25-28 August 2002.
33. Brandani S. and S.J.R. Simons "*The Centre for CO_2 Technology"*, London's Environment and Future - LEAF, London September 17-18, 2002
34. M. Nori and S. Brandani "*Heat Effects in the Zero Length Column Technique*", AIChE 2002 Annual Meeting, Indianapolis, USA, November 3-8, 2002.
35. Rouse A.J. and Brandani S. "*Efficient modelling of a Dual Piston Driven PSA Process for the Separation of CO_2*", CRYSTAL Faraday Partnership Workshop "Research Challenges in Separation Technologies", St Albans, 3-4 April 2003.
36. Di Federico G., Camplone I., Brandani S. and Barker J. *Coal Characterization for Carbon Dioxide Sequestration Purposes*. NATO-ASI Fluid Transport in Nanoporous Materials». La Colle Sur Loup, France, June 15-27, 2003.
37. Zhang K. and Brandani S., *CFD Modelling of a Fast Internally Circulating Fluidized Bed Biomass Gasifier*, Sino-German Workshop on Energetic Utilization of Biomass, Beijing, China, 8-11 Oct, 2003.
38. Ahn H. and Brandani S., *Dynamics of Carbon Dioxide Breakthrough in a Monolith Column*. 2003 AIChE Annual Meeting, San Francisco, USA, Nov. 16-21, 2003.
39. Cherntongchai P. and Brandani S., *A Model for the Interpretation of the Bed Collapse Experiment*. 2003 AIChE Annual Meeting, San Francisco, USA, Nov. 16-21, 2003.
40. Nori M. and Brandani S. *A Model for Sound Propagation in the Presence of Microporous Solids*. 2003 AIChE Annual Meeting, San Francisco, USA, Nov. 16-21, 2003.
41. Rouse A., Brandani S. and Ruthven D.M., *A Study of a Dual Piston Driven Pressure Swing Adsorption System for the Separation of CO2*. 2003 AIChE Annual Meeting, San Francisco, USA, Nov. 16-21, 2003.
42. Brandani S. *Hydrogen from Biomass*. Sourcing the Hydrogen Economy – 3. London, UK, Jan 13 2004.
43. Brandani S. *Tracer ZLC as an Informative Low-cost Technique for Diffusion Measurement.* Diffusion in Nanoporous Materials: from Fundamentals to Practical Issues – DECHEMA Kolloquium Frankfurt, Germany, Jan 15, 2004.
44. Ahn H. and Brandani S. *Dynamics of Carbon Dioxide Breakthrough in a Carbon Monolith.* Fundamentals of Adsorption 8, Sedona, AR, USA, May 23-28, 2004.
45. Brandani S. *On the Chromatograpic Measurement of Equilibrium Isotherms Using Large Concentration Steps*. Fundamentals of Adsorption 8, Sedona, AR, USA, May 23-28, 2004.
46. Jobic H., Karger J. Krause C., Brandani S. Gunadi A. Methivier A., Ehlers G. and Ruthven D.M. *Diffusion of n-Alkanes in 5A Zeolite Measured by Spin Echo, Pulsed Field Gradient NMR and Zero Length Column Techniques*. Fundamentals of Adsorption 8, Sedona, AR, USA, May 23-28, 2004.
47. Nori M. and Brandani S. *A Simplified Model for Acoustic Measurement of Diffusion in Microporous Solids.* Fundamentals of Adsorption 8, Sedona, AR, USA, May 23-28, 2004.
48. Ahn H. and Brandani S. *A New Numerical Method for Accurate Simulation of Fast Cyclic Adsorption Processes*, Plenary Lecture 5th Brazilian Meeting on Adsorption – EBA5, Natal, RN, Brazil, Jul 18-21, 2004.
49. Brandani F., Brandani S. and Pullumbi P. *Measurement of Infinite Dilution Heats of Adsorption Using the ZLC Technique*. 2004 AIChE Annual Meeting, Austin, TX, USA, Nov. 7-12, 2004.
50. Brandani S. and Zhang K., *A Model for the Prediction of the Behaviour of Fluidized Beds*. 2004 AIChE Annual Meeting, Austin, TX, USA, Nov. 7-12, 2004.

51. Cherntongchai P. and Brandani S. *Study of the Fluidization Properties of Fine Powders*. 2004 AIChE Annual Meeting, Austin, TX, USA, Nov. 7-12, 2004.
52. Gunadi A. and Brandani S. *Diffusivity Measurements of n-Paraffins in 5A Using the ZLC Technique*. 2004 AIChE Annual Meeting, Austin, TX, USA, Nov. 7-12, 2004.
53. Di Federico G. and Brandani S. *Calculating CO2 Storage Capacity in Coal Beds.* RECOPOL Workshop, Szczyrk, Poland, March 10-11, 2005.
54. Di Federico G. and Brandani S. *A Procedure for the Calculation of CO_2 Sequestration Capacity in Coal Beds*, 8th Conference on Process Integration, Modelling and Optimisation for Energy Saving and Poliution Reduction, PRES'05, Giardini di Naxos, Italy, May 15-18, 2005.
55. Bourdin V., Brandani S., Gunadi A., Jobic H., Krause C., Kärger J., and Schmidt W. *Diffusion of n-Alkanes in MFI-Type Zeolites: a Comparative Study with Different Measuring Techniques*, Diffusion Fundamentals I, Leipzig, Germany, September 21-24, 2005.
56. Brandani S., J. Caro, Jobic H., Krause C., Kärger J., Möller A. and Ruthven D.M. *A Remarkable non-Monotonical Chain-Length Dependence: Diffusion of n-Alkanes in Zeolites LTA.* Diffusion Fundamentals I, Leipzig, Germany, September 21-24, 2005.
57. Brandani S. *The Kinematic Theory of Fluidized Bed Expansion and Contraction.* 2005 AIChE Annual Meeting, Cincinnati, OH, USA, Oct. 30- Nov. 4, 2005.
58. Gunadi A. and Brandani S. *Diffusivities of n-Alkanes in Silicalite Using the ZLC Method.* 2005 AIChE Annual Meeting, Cincinnati, OH, USA, Oct. 30- Nov. 4, 2005.
59. Di Federico G., Brandani S., Bazan R. and Staudt R. *Gravimetric Measurement of Coal Adsorption Isotherms.* 2005 AIChE Annual Meeting, Cincinnati, OH, USA, Oct. 30- Nov. 4, 2005.
60. Brandani S. and Ahn H. *A Numerical Method for the Accurate Simulation of Fast Cyclic Adsorption Processes.* 2005 AIChE Annual Meeting, Cincinnati, OH, USA, Oct. 30- Nov. 4, 2005.
61. Brandani S., Gunadi A., Bourdin V., Jobic H., Kärger J., Krause C., Krutyeva M., Shah D.B. and Schmidt W. *Benefit and Problems of the Application of Different Techniques of Diffusion Measurement: n-Alkanes in Zeolites ZSM-5 and Silicalite-1.* 18th Annual Meeting of the German Zeolite Association, Hannover, Germany, Mar. 1-3, 2006.
62. Jobic H., Brandani S., Caro J., Yang X., Kärger J., Krause C., Möller A., Staudt R. and Shah D.B. *A Concerted Diffusion Study of n-Alkanes in Zeolite NaCaA.* 18th Annual Meeting of the German Zeolite Association, Hannover, Germany, Mar. 1-3, 2006.
63. Brandani S. *The Partial Loading ZLC Experiment.* 4th Pacific Basin Conference on Adsorption Science and Technology, Tianjin, China, May 22-26, 2006.
64. Brandani S. and Zhang K. *CFD Modelling of a Biomass Gasifier.*, World Renewable Energy Congress IX, Florence, Italy, 19-25 August 2006.
65. Galloway D., Houdek S., Allen R., Wilson S. and Brandani S. *Adsorption of n-Alkanes on 5A Measured Using the ZLC Method.* 2006 AIChE Annual Meeting, San Francisco, CA, USA, Nov. 12-17, 2006.
66. Brandani S. *The Partial Loading Zero Length Column Experiment.* 2006 AIChE Annual Meeting, San Francisco, CA, USA, Nov. 12-17, 2006.
67. Brandani S., Caro J., Yang, X., Jobic H., Kärger J., Krause C., Lercher J., Jentys A., Staudt R., Möller A., Ruthven D.M., Shah D.B. and Schmidt W. *Recent Developments in the Measurement of Diffusion in Zeolites.* Fundamentals of Adsorption 9, Giardini di Naxos, Italy, May 20-25, 2007.
68. Fiandaca G., Fraga E.S. and Brandani S. *Direct Search Methods for the Design of PSA Processes.* 22nd Biennial Conference on Numerical Analysis, Dundee, UK, 26-29 Jun. 2007
69. Brandani S., Caro J., Jobic H., Kärger J., Krause C. and Staudt R. *Diffusion of n-Alkanes in Zeolites: the Benefit of Observation over Different Length Scales.* 15th International Zeolite Conference, Beijing, China Aug. 12-17, 2007.
70. Brandani S. *Challenges in Macroscopic Measurement of Diffusion in Zeolites.* Diffusion Fundamentals II, L'Aquila, Italy 26-29 Aug. 2007.
71. Brandani S., Cherntongchai P., Zhang K. *Prediction of the Minimum Bubbling Point*. 2007 AIChE Annual Meeting, Salt Lake City, UT, USA, 4-9 Nov. 2007.
72. Fiandaca G., Fraga E.S. and Brandani S. *Development of Computer Aided Tools for the Optimization of PSA Processes*. 2007 AIChE Annual Meeting, Salt Lake City, UT, USA, 4-9 Nov. 2007.
73. Brandani S. *Axial Dispersion and the Danckwerts Boundary Conditions*. 2007 AIChE Annual Meeting, Salt Lake City, UT, USA, 4-9 Nov. 2007.
74. Benin A.I., Low J.J., Faheem S., Wong-Foy A.G., Koh K., Matzger A.J., Yazaydin A.O., Snurr R.Q., Brandani S., Liu J., LeVan M.D. and Willis R.R. *Metal Organic Frameworks for Carbon Dioxide Capture*. 2008 AIChE Spring National Meeting, New Orleans, LA, USA, 6-10 Apr. 2008.
75. Willis R., Benin A., Faheem S., Low J., Venimadhaven G., Snurr R., Yazaydin O, Matzger A., Wong-Foy A., Koh K., LeVan D., Liu J. and Brandani S. *Toward metal-organic frameworks in industrial processes: carbon dioxide capture*. 1st International Conference on Metal - Organic Frameworks and Open Framework Compounds Augsburg, Germany, 8-10 October, 2008.
76. Brandani S., Hufton J.R. *Modelling Adsorption in Monoliths*. 58th Canadian Chemical Engineering Conference, Ottawa, Ontario, Canada, 19-22 Oct. 2008.

77. Brandani S., Hu X. and Willis R.R. *Development of a semi-automated ZLC system for rapid screening of adsorbents for carbon capture.* 2009 AIChE Annual Meeting, Nashville, TN, Nov. 2009
78. Brandani S. *Air capture: does it make sense?* 2009 AIChE Annual Meeting, Nashville, TN, Nov. 2009
79. Brandani S., Brandani P., Wu D.J. and Hufton J.R. *R Modelling Adsorption in Monolithic Adsorbents.* Fundamentals of Adsorption 10, Awaji, Japan, May 23-28, 2010.
80. Brandani S., Hu X., Benin A.I. and Willis R.R. *A Semi-Automated ZLC System for Rapid Screening of Adsorbents for Carbon Capture.* Fundamentals of Adsorption 10, Awaji, Japan, May 23-28, 2010.
81. Brandani S. *Capturing CO_2 from Air: Does it Make Sense?* World Renewable Energy Congress XI, Abu Dhabi, UAE, 25-30 Sep. 2010.
82. Dang W., Friedrich D., Ferrari M.C. and Brandani S. *Total Reflux Dual Piston-PSA: a Novel Apparatus for Testing Adsorbent Materials.* 2010 AIChE Annual Meeting, Salt Lake City, UT, USA, 7-12 Nov. 2010.
83. Friedrich D., Ferrari M.C., Patel L. and Brandani S. *Efficient Numerical Schemes for the Simulation of Adsorption Processes to Cyclic Steady State.* 2010 AIChE Annual Meeting, Salt Lake City, UT, USA, 7-12 Nov. 2010.
84. Mangano E., Hu X., Ahn H. and Brandani S. *Efficient and Rapid Screening of Novel Adsorbents for Carbon Capture in the UK IGSCC Project.* 2010 AIChE Annual Meeting, Salt Lake City, UT, USA, 7-12 Nov. 2010.
85. Brandani S. *The Challenge of Carbon Capture from Air*, Invited Plenary, 34th Annual British Zeolite Association Conference, Edinburgh, UK, 11 Apr 2011.
86. Ozcan, D. C., Ahn, H., Brandani, S. *Process Integration of Ca-Looping Process with a Cement Manufacturing Plant*, Joint UKCCSC and CO2CHEM Meeting; Nottingham, July 2011.
87. Brandani S. *Rapid Ranking of Novel Adsorbents for Carbon Capture Applications*, PSA 2011 Conference, Edinburgh, UK, 6 Sep 2011.
88. Mangano E., Hu X., Brandani S., Lozinka M.M.L., Wright P. A., Kahr J., Croad M., McKeown N., Shamsipour H., Budd P. *Screening Novel CO_2 Adsorbents in the UK IGSCC Project.* Separation Technologies for CO_2 Capture. IChemE, Swansea, UK, 23 Sep 2011.
89. Ahn H., Kapetaki Z., Liu Z., and Brandani S. *Process Configuration Studies on Conventional Pre-combustion and Post-combustion Carbon Capture.* Separation Technologies for CO_2 Capture. IChemE, Swansea, UK, 23 Sep 2011.
90. Friedrich D., Ferrari M.C., Reid P. and Brandani S. *Efficient Simulations of General Adsorption Cycles.* Mathematical Modelling and Simulation of Power Plants and CO_2 Capture. Warwick University, Warwick, UK, 20-21 Mar 2012.
91. Mangano E., Brandani S. and Thommes M. *Use of an Autosorb System for the Measurement of Diffusion of CO_2 in an Ion-Exchanged Zeolite Rho.* 2012 AIChE Annual Meeting, Pittsburgh, PA, USA, 28 Oct. to 02 Nov. 2012.
92. Mangano E., Brandani S, Lozinska M.M. and Wright P.A., *Diffusion of CO_2 in Ion-Exchanged Zeolites Rho Studied by the ZLC Technique.* 2012 AIChE Annual Meeting, Pittsburgh, PA, USA, 28 Oct. to 02 Nov. 2012.
93. Bocciardo D., Ferrari M.C. and Brandani S. *Membrane Processes Applied to Carbon Capture in Coal-Fired Power Plants: Multi-Stage Design and Economic Analysis.* 2012 AIChE Annual Meeting, Pittsburgh, PA, USA, 28 Oct. to 02 Nov. 2012.
94. Ozcan D.C., Ahn H. and Brandani S. *Techno-Economic Study of Ca-Looping Processes for Carbon Capture From Cement Plants.* 2012 AIChE Annual Meeting, Pittsburgh, PA, USA, 28 Oct. to 02 Nov. 2012.
95. Dang W., Friedrich D., Ferrari M.C. and Brandani S. *Total Reflux Dual Piston PSA.* 2012 AIChE Annual Meeting, Pittsburgh, PA, USA, 28 Oct. to 02 Nov. 2012.
96. Dang W., Friedrich D. and Brandani S. *Characterisation of an Automated Dual Piston Pressure Swing Adsorption (DP-PSA) System.* 11th International Conference on Greenhouse Gas Control Technologies (GHGT11), Kyoto, Japan, 18-22 November 2012.
97. Kapetaki Z., Ahn H. and Brandani S. *Detailed Process Simulation of Pre-Combustion IGCC Plants using Coal-Slurry and Dry Coal Gasifiers.* 11th International Conference on Greenhouse Gas Control Technologies (GHGT11), Kyoto, Japan, 18-22 November 2012.
98. Ahn H., Luberti M., Liu Z. and Brandani S. *Process Simulation of Aqueous MEA Plants for Post-Combustion Capture from Coal-Fired Power Plants.* 11th International Conference on Greenhouse Gas Control Technologies (GHGT11), Kyoto, Japan, 18-22 November 2012.
99. Mangano E., Brandani S., Ferrari M.C., Ahn H., Friedrich D., Lozinska M.L., Wright P.A., Kahr J., Morris R., Croad M., McKeown N., Shamsipour H. and Budd P. *Efficient and Rapid Screening of Novel Adsorbents for Carbon Capture in the UK IGSCC Project.* 11th International Conference on Greenhouse Gas Control Technologies (GHGT11), Kyoto, Japan, 18-22 November 2012.
100. Romano M.C., Martinez I., Murillo R., Arstad B., Blom R., Ozcan D.C., Ahn H. and Brandani S. *Process Simulation of Ca-looping Processes: Review and Guidelines.* 11th International Conference on Greenhouse Gas Control Technologies (GHGT11), Kyoto, Japan, 18-22 November 2012.
101. Bocciardo D., Ferrari M.C. and Brandani S. *Modelling and Multi-Stage Design of Membrane Processes Applied to Carbon Capture in Coal-Fired Power Plants.* 11th International Conference on Greenhouse Gas Control Technologies (GHGT11), Kyoto, Japan, 18-22 November 2012.
102. Ahn H., Ferrari M.C. and Brandani S. *Process Simulation in Edinburgh Carbon Capture Group.* UKCCSRC Industrial Workshop: CCS Systems, London, UK, Jan 30 2013.

103. Ahn H., Kapetaki Z., Brandani P., Luberti M. and Brandani S. Process *Configurations for Pre- and Post-Combustion Carbon Capture for Power Plants.* Separation Technologies for CO_2 Capture, IChemE, Edinburgh, UK, 19 Apr 2013.
104. Banu A.M., Friedrich D., Brandani S. and Düren T. *A Multi-scale Study of MOFs as Adsorbents in H_2 PSA Purification.* Fundamentals of Adsorption 11, Baltimore, USA, May 19-24, 2013.
105. Luberti M., Ahn H., Friedrich D. and Brandani S. *Design of Multiple Columns H_2 Pressure Swing Adsorption in H_2 and Power Co-generation IGCC with Pre-combustion Carbon Capture.* Fundamentals of Adsorption 11, Baltimore, USA, May 19-24, 2013.
106. Friedrich D., Mangano E., Hu X. and Brandani S. *Automated Estimation of Kinetic and Isotherm Parameters from ZLC Experiments.* Fundamentals of Adsorption 11, Baltimore, USA, May 19-24, 2013.
107. Beck J., Friedrich D., Brandani S. and Fraga E.S. *Surrogate Based Multi-objective Optimisation for the Design of Pressure Swing Adsorption Systems.* Fundamentals of Adsorption 11, Baltimore, USA, May 19-24, 2013.
108. Ferrari M.C., Friedrich D., Santori G. and Brandani S. *Design of a Small Scale Air Capture System.* Fundamentals of Adsorption 11, Baltimore, USA, May 19-24, 2013.
109. Dang W., Friedrich D., Brandani S., *Single Pellet DP-PSA Experiments for the Characterization of Heat and Mass Transfer Parameters.* Fundamentals of Adsorption 11, Baltimore, USA, May 19-24, 2013.
110. Lozinska M., Mangano E., Mowat J., Shepherd A., Howe R., Thompson S., Parker J., Brandani S. and Wright P. *Understanding Selective Carbon Dioxide Adsorption on Univalent Cation Forms of the Flexible Zeolite Rho.* Fundamentals of Adsorption 11, Baltimore, USA, May 19-24, 2013.
111. Oreggioni G.D., Ahn H., Friedrich D. and Brandani S. *Equilibrium Theory Solver for PSA Modelling Applied to Carbon Capture Applications.* Fundamentals of Adsorption 11, Baltimore, USA, May 19-24, 2013.
112. Bocciardo D., Ferrari M.C. and Brandani S. *Multi-Stage Design for Carbon Capture from Coal-fired Power Plants: From Process Design to Economic Analysis.* SIMPAM 2013 - 2nd Membrane Separation Processes Symposium, Rio de Janeiro, Brazil, Jul 29 – Aug 2 2013.
113. Bocciardo D., Ferrari M.C. and Brandani S. *1D and 2D Approaches for Modelling Hollow-fibre and Spiral-Wound Permeators for Gas Separation.* SIMPAM 2013 - 2nd Membrane Separation Processes Symposium, Rio de Janeiro, Brazil, Jul 29 – Aug 2 2013.
114. Mangano E., Brandani S., Lozinska M.M. and Wright P.A. *Diffusion of CO_2 in Ion-Exchanged Zeolites Rho Studied by the ZLC Technique.* Diffusion Fundamentals V, Leipzig, Germany, August 26-28 2013.
115. Ahn H., Kapetaki Z., Brandani P., Luberti M. and Brandani S. *Process Configuration Studies of Conventional Pre- and Post-Combustion Carbon Capture for Power Plants.* 2013 AIChE Annual Meeting, San Francisco, CA, USA, 03-08 November 2013.
116. Mangano E., Hu X., Friedrich F., Ahn H. and Brandani S. *Diffusion Mechanism of CO_2 in 13X Zeolite Pellets.* 2013 AIChE Annual Meeting, San Francisco, CA, USA, 03-08 November 2013.
117. Beck J., Friedrich D., Brandani S. and Fraga E.S. *Surrogate Based Multi-Objective Optimisation for the Design of Pressure Swing Adsorption Systems.* 2013 AIChE Annual Meeting, San Francisco, CA, USA, 03-08 November 2013.
118. Friedrich D., Mangano E., Hu X., Ferrari M.C. and Brandani S. *Automated Analysis of ZLC Experiments: Fitting of Kinetic and Isotherm Parameters.* 2013 AIChE Annual Meeting, San Francisco, CA, USA, 03-08 November 2013.
119. Ozcan D.C., Bocciardo D., Ferrari M.C., Ahn H., Kierzkowska A.M., Müller C.R. and Brandani S. *Comparison of Various Carbon Capture Technologies to Reduce CO_2 Emissions From a Cement Plant.* 2013 AIChE Annual Meeting, San Francisco, CA, USA, 03-08 November 2013.
120. Ahn H., Luberti M., Ozcan D.C., Friedrich D., Kapetaki Z., Brandani P. and Brandani S. *Cogeneration of Ultrapure Hydrogen and Power at an Advanced Integrated Gasification Combined Cycle with Pre-Combustion Capture.* The 4th Korea CCS International Conference, Jeju, Korea, Feb 24-26 2014.
121. Luberti M., Friedrich D., Brandani S. and Ahn H. *Cogeneration of Ultrapure Hydrogen and Power at an Advanced Integrated Gasification Combined Cycle with Pre-Combustion Capture.* The 12th European Gasification Conference, New Horizons in Gasification, Rotterdam, Holland, Mar. 10-13 2014.
122. Luberti M., Brandani S. and Ahn H. *Use of a Rigorous Energy Balance Including Kinetic Energy in the Process Simulation of a Rapid Pressure Swing Adsorption.* Advanced Process Modelling Forum 2014, London, UK, April 2-3 2014.
123. Gibson J.A.A., Gromov A.V., Hunter B., Brandani S. and Campbell E.E.B. *The Functionalization of Multi-Walled Carbon Nanotubes and Carbon Materials for Application in Gas Separation and Gas Sensors,* NT14, Los Angeles, CA, USA, June 2-6 2014.
124. Lasseuguette E., Ferrari M.C., Brandani S. *Humidity Impact on the Gas Permeability of PIM-1.* ICOM 2014, Suzhou, China, July 20-25 2014.
125. Mangano E., Shiko E., Greenaway A., Gibson A., Gromov A., Lozinska M.M., Ahn H., Ferrari M.C., Yiu H.,. Campbell E., Wright P.A. and Brandani S. *Adsorption Materials and Processes for Carbon Capture from Gas-Fired Power Plants – AMPGas*, UKCCSRC Biannual Meeting, Cardiff, UK, September 10-11 2014.
126. Shiko E., Greenaway A., Wright P.A. and Brandani S. *Optimisation of Porous Solid Adsorbents for Post-Combustion Carbon Capture.* UKCCSRC Biannual Meeting, Cardiff, UK, September 10-11 2014.

127. Mangano E., Shiko E., Greenaway A., Gibson A., Gromov A., Lozinska M.M., Ahn H., Ferrari M.C., Yiu H.,. Campbell E., Wright P.A. and Brandani S. *Adsorption Materials and Processes for Carbon Capture from Gas-Fired Power Plants – AMPGas*, UKCCSRC Biannual Meeting, Cardiff, UK, September 10-11 2014.
128. Ozcan D.C., Brandani S.and Ahn H. *A Hybrid Carbon Capture System of Indirect Calcination and Amine Absorption for a Cement Plant*, GHGT12, Austin, TX, USA, October 5-9 2014.
129. Lasseuguette E., Ferrari M.C., Brandani S. *Humidity Impact on the Gas Permeability of PIM-1 Membrane for Post-Combustion Application*, GHGT12, Austin, TX, USA, October 5-9 2014.
130. Bryan N., Lasseuguette E., van Dalen M., Permogorov N., Amieiro A., Brandani S., Ferrari M.C. *Development of Mixed Matrix Membranes Containing Zeolites for Post-Combustion Carbon Capture*. GHGT12, Austin, TX, USA, October 5-10 2014.
131. Luberti M., Friedrich D., Ozcan D.C., Brandani S., and Ahn H. *A Novel Strategy to Produce Ultrapure Hydrogen from Coal with Pre-Combustion Carbon Capture*. GHGT12, Austin, TX, USA, October 5-9 2014.
132. Ahn H., Kapetaki Z., Brandani P. and Brandani S. *Process Simulation of a Dual-Stage Selexol unit for Pre-Combustion Carbon Capture at an IGCC Power Plant*, GHGT12, Austin, TX, USA, October 5-9 2014.
133. Mangano E., Friedrich D. and Brandani S. *Modelling Rotary Wheel Adsorbers for Gas Separations*, IChemE Meeting "Emerging Separation Technologies", London, UK, October 10 2014.
134. Mangano E. and Brandani S. *Robust Algorithms for the Solution of the Ideal Adsorbed Solution Theory Equations*, 2014 AIChE Annual Meeting, Atlanta, GA, USA November 16-21 2014.
135. Cychosz K., Mangano E., Thommes M. and Brandani S. *Adsorption Kinetics Measurement Using a Volumetric System*, 2014 AIChE Annual Meeting, Atlanta, GA, USA November 16-22 2014.
136. Ahn H., Luberti M. and Oreggioni G.D. *A Post-Combustion CO2 Capture Rapid Pressure/Vacuum Swing Adsorption Process and Its Application for Decarbonizing a Coal-Fired Power Plant*. 2014 AIChE Annual Meeting, Atlanta, GA, USA, November 16-21 2014.
137. Ahn H., Luberti M., Kapetaki Z., Friedrich D., Ozcan D.C., Luo X., Brandani P. and Brandani S. *Process Design of a Coal-Based Hydrogen Plant with CO2 Capture and Its Improvement*. 2014 AIChE Annual Meeting, Atlanta, GA, USA, November 16-21 2014.
138. Costenaro D., Vittoni C., Bisio C., Paul G., Gatti G., Brandani S., Mangano E. and Marchese L. *Synthesis, Functionalization and Physico-Chemical Characterization of Organic-Inorganic Hybrid Materials for CO_2 Adsorption.* 6th Czech-Italian-Spanish Conference on Molecular Sieves and Catalysis, Amantea, Italy, 14-17 June 2015.
139. Mangano E., Shiko E., Greenaway A., Gibson A., Gromov A., Lozinska M.M., Campbell E., Wright P. and Brandani S. *Rotary Wheel Adsorber for Carbon Capture*, 2015 ACS Fall National Meeting, Boston, MA, USA, August 16-20, 2015.
140. Brandani S., Brandani F. and Brandani P. *Predicting the Formation of Liquid-Liquid Phase Splits from Mixing Rules Thermodynamically Correct in the Limit of Zero Pressure.* Thermodynamics 2015, Copenhagen, Denmark, September 15-18, 2015.
141. Brandani S., Luberti M. and Mangano E. *Absolute and Net Adsorption in the Ideal Adsorbed Solution Theory*, 2015 AIChE Annual Meeting, Salt Lake City, UT, USA November 8-13 2015.
142. Brandani S., Mangano E. and Sarkisov L. *Absolute, Excess and Net Adsorption and Helium Adsorption*, 2015 AIChE Annual Meeting, Salt Lake City, UT, USA November 8-13 2015.
143. Dang W., Friedrich D. and Brandani S. *Total Reflux Dual-Piston Pressure Swing Adsorption System*, 2015 AIChE Annual Meeting, Salt Lake City, UT, USA November 8-13 2015.
144. Mangano E., Friedrich D. and Brandani S. *Rotary Wheel Adsorber for Carbon Capture*, 2015 AIChE Annual Meeting, Salt Lake City, UT, USA November 8-13 2015.
145. Bisio C., Costenaro D., Vittoni C., Paul G., Gatti G., Brandani S., Mangano E., Crocellà V., Bordiga S., Marchese L. *Synthesis, Functionalization and Physico-Chemical Characterization of Organic-Inorganic Hybrid Materials for CO_2 Adsorption.* 18th International Zeolite Conference, Rio de Janeiro, Brazil, 19-24 June, 2016.
146. Brandani S. *Determining the Properties of Novel Nanoporous Materials for the Evaluation of Process Performance in Carbon Capture Applications*. VI International Workshop on Oxide-based Materials, Naples, Italy, September 21-24, 2016.
147. Brandani S. *A Simple Graphical Check of Consistency for Zero Length Column Desorption Curves*, 2016 AIChE Annual Meeting, San Francisco, CA, USA November 13-18 2016.
148. Melo F.L.G., Mangano E., Ferrari M.C., Cavalcante C.L. and Brandani S. *Measurement of the Density of Microporous Materials Needed to Convert Net Adsorption to Absolute Adsorption*, 2016 AIChE Annual Meeting, San Francisco, CA, USA November 13-18 2016.
149. Georgiadis M.C., Nikolaidis G., Kikkinides E., Brandani S. and Blom R. *Modeling, Simulation and Optimization of Pressure Swing Adsorption (PSA) Processes for Post-Combustion Carbon Dioxide (CO_2) Capture from Flue Gas*, 2016 AIChE Annual Meeting, San Francisco, CA, USA November 13-18 2016.
150. Bryan N., Maina J., Dumée L.F., Brandani S. and Ferrari M.C. *Clustering Effects in Mixed Matrix Membranes Formed By Nano-Sized ZIF-8 and Pebax*, 2016 AIChE Annual Meeting, San Francisco, CA, USA November 13-18 2016.

151. Sarkisov L., Centineo A., Farmahini A.H. and Brandani S. *Molecular Simulation and Experiments of Water Adsorption in a High Surface Area Activated Carbon: Hysteresis, Scanning Curves and Spatial Organization of Water Clusters.* COPS-XI, Avignon, France, May 14-17, 2017.
152. Improta O., Ozcan D.C., Ahn H., Brandani S. and Ferrari M.C. *Retrofit of Membrane Carbon Capture Processes to Cement Manufacture.* 9th Trondheim Conference on CO_2 Capture, Transport and Storage Trondheim, Norway, June 12-14, 2017.
153. Brandani S. *The Zero Length Column Technique for the Measurement of Adsorption Equilibrium and Kinetic Properties of Nanoporous Materials*, Johnson-Matthey Reaction and Transport Expertise Symposium, Sonning Common, UK, 20 June, 2017.
154. Brandani S. *The Zero Length Column Technique for the Measurement of Adsorption Equilibrium and Kinetic Properties of Nanoporous Materials*, 7th FEZA Conference, July, 3-7, 2017, Sofia, Bulgaria.