

Životopis

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Vzdelanie

1997 **PhD.**, Department of Chemical Engineering and Materials Science,
University of Minnesota, Minneapolis, USA

1990 **Ing.**, Fakulta chemickej a potravinárskej technológie,
Slovenská technická univerzita, Bratislava

Zamestnanie

2013 - teraz **profesor**, University of Strathclyde, Glasgow, Veľká Británia
2018 - 2024 **vedúci katedry**, Katedra chemického a procesového inžinierstva,
University of Strathclyde, Glasgow, Veľká Británia
2008 - 2013 **reader**, University of Strathclyde, Glasgow, Veľká Británia
2005 - 2008 **senior lecturer/docent**, University of Strathclyde, Glasgow, Veľká Británia
1999 - 2005 **samostatný vedecký pracovník**, Ústav chemického a biochemického inžinierstva,
Eidgenössische Technische Hochschule (ETH), Zürich, Švajčiarsko
1997 - 1999 **vedecký pracovník**, California Institute of Technology (Caltech), Pasadena, USA

Výskumná činnosť

Moja výskumná expertíza je v časticovom a nanomateriálovom inžinierstve so zameraním na dizajn nových časticových produktov a procesov na ich výrobu v širokom rozsahu aplikácií od nukleácie a kryštalizácie po samozostavovanie peptidov, organické gély a nanokompozity. Mojou výskumnou víziou je vyvinúť systematické postupy na navrhovanie a výrobu časticových produktov s požadovanými vlastnosťami prispôbenými pre špecifické aplikácie. To si vyžaduje riadenú tvorbu požadovaných častíc v robustných, efektívnych a trvalo udržateľných výrobných procesoch, výsledkom čoho sú časticové produkty s cieľovými vlastnosťami a funkciami.

Môj výskum v oblasti farmaceutických výrobných procesov je v rámci výskumného centra pre kontinuálnu výrobu a pokročilú kryštalizáciu CMAC (www.cmac.ac.uk). Vyvíjame tam pracovné postupy pre vývoj produktov a procesov časticových systémov pre farmaceutické aplikácie, aby sme získali lepšiu kontrolu kritických atribútov kvality pri výrobe liekov pri súčasnom znížení nákladov a dopadu na životné prostredie s cieľom zlepšiť zdravie spoločnosti. Vyvíjame tiež nové metódy na získavanie informácií v reálnom čase z procesných analytických nástrojov založených na optických a spektroskopických metódach, aby sme umožnili inteligentnú podporu rozhodovania pri monitorovaní a riadení časticových systémov a procesov, vrátane presných kvantitatívnych odhadov tvaru a distribúcie veľkosti výsledných častíc.

Môj výskum bol podporovaný z rôznych zdrojov vrátane štátnych grantových agentúr (napr. EPSRC, BBSRC, SFC), charitatívnych organizácií (Carnegie Trust, Leverhulme Trust) a priemyslu (napr. GSK, AstraZeneca, Novartis, Merck), s viac ako 20 projektmi s celkovou hodnotou viac ako 40 miliónov GBP (s mojím podielom na hodnote viac ako 7 miliónov GBP). Spoluzaložil som výskumné centrum CMAC, kde som spolupracoval pri formovaní technickej vízie a strategického rozvoja vedúceho k úspešným zdrojom financovania včítane: EPSRC Centre for Innovative Manufacturing (2011), Doctoral Training Centre (2012), Future ICT-enabled Manufacturing (2013), Future Manufacturing Hub (2017), Sustainable Manufacturing (2022) and Manufacturing Hub for a Sustainable Future (2024). Doteraz som viedol 19 doktorandov (zatiaľ bolo udelených 16 PhD) na University of Strathclyde a 3 doktorandov (udelené 3 PhD) na ETH Zürich.

Som členom výkonného výboru British Association of Crystal Growth a zástupcom Veľkej Británie v pracovnej skupine pre kryštalizáciu Európskej federácie chemického inžinierstva. Publikoval som viac ako 130 článkov v karentovaných časopisoch (indexovaných v databázach Web of Science a Scopus) s viac ako 4000 citáciami a h-indexom 37 (Web of Science a Scopus).

Pedagogická činnosť

University of Strathclyde, Glasgow (2005-teraz)

- Časticové technológie (2007-2017, 2024 - teraz)
- Pokročilé reaktorové inžinierstvo (2016-2017)
- Reaktorové inžinierstvo (2014-2017)
- Riešenie inžinierskych problémov (2012-2014)
- Koordinátor štúdia 4. ročníka (2008-2018)
- Koordinátor projektu chemickoinžinierskeho dizajnu (2008-2018)
- Koloidné inžinierstvo (2006-2013)
- Laboratórium chemického inžinierstva (2005-2008)
- Vedenie projektov chemickoinžinierskeho dizajnu (od roku 2005)
- Vedenie študentských výskumných projektov (od roku 2005)

Eidgenössische Technische Hochschule (ETH), Zürich (2000-2005)

- Numerické a štatistické metódy
- Matlab pre chemických inžinierov
- Vedenie študentských výskumných projektov

University of Minnesota, Minneapolis (1992-1995)

- Chemickoinžinierska termodynamika a kinetika
- Laboratórium jednotkových operácií
- Pokročilé matematické metódy

Slovenská technická univerzita, Bratislava (1990-1991)

- Matematika

Riadiaca and organizačná činnosť

- Člen vedenia výskumného centra CMAC (2024-teraz)
- Člen výkonného výboru správnej rady univerzity (2022-2024)
- Člen správnej rady univerzity (2021-2024)
- Člen univerzitného senátu (2018-2024)
- Vedúci katedry (2018-2024)
- Akademický riaditeľ doktorandského centra CMAC (2012-2019)
- Člen univerzitnej komisie doktorandských centier (2012-2015)
- Člen technickej komisie priemyselného konzorcia výskumného centra CMAC (2012-2015)
- Člen univerzitnej komisie pre excelentnosť výskumu (2011-2014)
- Člen rady univerzitného programu Bridging the Gaps (2010-2012)
- Zástupca vedúceho katedry (2009-2013; 2014-2018)

- Člen študijnej rady fakulty inžinierstva (2006-2010)
- Člen výskumnej komisie fakulty inžinierstva (2006-2009)
- Koordinátor pre výskum a doktorandské štúdium na katedre chemického a procesového inžinierstva (2006-2009)
- Koordinátor pre celoštátne hodnotenie kvality výskumu RAE 2008 na katedre chemického a procesového inžinierstva (2006-2008)

Publikácie v karentovaných časopisoch (v databázach Web of Science & Scopus)

1. J. Sefcik, A.V. McCormick "Thermochemistry of solution silicate precursors to ceramics" **AIChE Journal** 43, 2773-2784 (1997).
2. J. Sefcik, A.V. McCormick "Kinetic and thermodynamic issues in sol-gel processes starting from silicon alkoxides" **Catalysis Today** 35, 205-223 (1997).
3. V. Tricoli, J. Sefcik, A.V. McCormick "Synthesis of oriented zeolite membranes at the interface between two fluid phases" **Langmuir** 13, 4193-4196 (1997).
4. J. Sefcik, A.V. McCormick "What is the solubility of zeolite A?" **Microporous Materials** 10, 173-179 (1997).
5. J. Sefcik "Is the reaction equilibrium composition in non-ideal mixtures uniquely determined by the initial composition?" **Journal of Chemical Education** 75, 587-588 (1998).
6. J. Sefcik, A.V. McCormick "Prediction of crystallization diagrams for synthesis of zeolites" **Chemical Engineering Science** 54, 3513-3519 (1999).
7. J. Sefcik, S.E. Rankin, S.J. Kirchner, A.V. McCormick "Esterification, condensation and deprotonation equilibria of trimethylsilanol" **Journal of Non-Crystalline Solids** 258, 187-197 (1999).
8. S.E. Rankin, J. Sefcik, A.V. McCormick "Trimethylethoxysilane liquid-phase hydrolysis equilibrium and dimerization kinetics: catalyst, non-ideal mixing and the condensation route" **Journal of Physical Chemistry A** 103, 4233-4241 (1999).
9. S.E. Rankin, J. Sefcik, A.V. McCormick "Similarities in the hydrolysis pseudoequilibrium behavior of methyl-substituted ethoxysilanes" **Industrial and Engineering Chemistry Research** 38, 3191-3198 (1999).
10. M.W. Daniels, J. Sefcik, L.F. Francis, A.V. McCormick "Reactions of a tri-functional silane coupling agent in the presence of colloidal silica sols in polar media" **Journal of Colloid and Interface Science** 219, 351-356 (1999).
11. M. Sefcikova, J. Sefcik, J. Sefcik, V. Bales "Kinetics of casein micelle destabilization" **Chemical Papers** 54, 345-360 (2000).
12. J. Sefcik, G. Storti, H. Wu, M. Morbidelli "Chemical engineering of polymer dispersions" **Chimia** 55, 123-127 (2001).
13. J. Sefcik, W. A. Goddard III "Thermochemistry of silicic acid deprotonation: Comparison of gas phase and solvated DFT calculations to experiment" **Geochimica et Cosmochimica Acta** 65, 4435-4443 (2001).

14. J. Sefcik, E. Demiralp, T. Cagin, W. A. Goddard III "Dynamic charge equilibration-Morse stretch force field: Application to energetics of pure silica zeolites" **Journal of Computational Chemistry** 23, 1507-1514 (2002).
15. J. Sefcik, M. Krosiak, M. Morbidelli "Optical response of porous titania-silica waveguides to surface charging in electrolyte filled pores" **Helvetica Chimica Acta** 85, 3508-3515 (2002).
16. M. Sefcikova, J. Sefcik, J. Sefcik "Modification of casein micelles by enzymatic hydrolysis" **Chemical Papers** 56, 400-405 (2002).
17. J. Sefcik, S.E. Rankin "Monte Carlo simulations of size and structure of gel precursors in silica polycondensation" **Journal of Physical Chemistry B** 107, 52-60 (2003).
18. M. Lattuada, P. Sandkühler, H. Wu, J. Sefcik, M. Morbidelli "Aggregation kinetics of polymer colloids in reaction limited regime: Experiments and simulations" **Advances in Colloid and Interface Science** 103, 33-56 (2003).
19. J. Sefcik, M. Verduyn, G. Storti, M. Morbidelli "Charging of latex particles stabilized by sulfate surfactant" **Langmuir** 19, 4778-4783 (2003).
20. P. Sandkühler, J. Sefcik, M. Lattuada, H. Wu, M. Morbidelli "Modeling structure effects on aggregation kinetics in colloidal dispersions" **AIChE Journal** 49, 1542-1555 (2003).
21. H. Wu, M. Lattuada, P. Sandkühler, J. Sefcik, M. Morbidelli "Role of sedimentation and bouyancy in the kinetics of diffusion limited colloidal aggregation" **Langmuir** 19, 10710-10718 (2003).
22. P. Sandkühler, J. Sefcik, M. Morbidelli "Kinetics of gel formation in dilute dispersions with strong attractive particle interactions" **Advances in Colloid and Interface Science** 108-109, 133-143 (2004).
23. M. Lattuada, P. Sandkühler, H. Wu, J. Sefcik, M. Morbidelli "Kinetic modeling of aggregation and gel formation in quiescent dispersions of polymer colloids" **Macromolecular Symposia** 206, 307-320 (2004).
24. M. Lattuada, H. Wu, P. Sandkühler, J. Sefcik, M. Morbidelli "Modeling of aggregation kinetics of colloidal systems and its validation by light scattering measurements" **Chemical Engineering Science** 59, 1783-1798 (2004).
25. E. Bonanomi, P. Sandkühler, J. Sefcik, M. Morari, M. Morbidelli "Precursor aggregate distributions for particulate gels" **Industrial and Engineering Chemistry Research** 43, 4740-4752 (2004).
26. E. Bonanomi, J. Sefcik, M. Morari, M. Morbidelli "Analysis and control of turbulent coagulator" **Industrial and Engineering Chemistry Research** 43, 6112-6124 (2004).
27. P. Sandkühler, J. Sefcik, M. Morbidelli "Kinetics of aggregation and gel formation in concentrated polystyrene colloidal dispersions" **Journal of Physical Chemistry B** 108, 20105-20121 (2004).
28. A. Vaccaro, J. Sefcik, M. Morbidelli "Characterization of colloidal polymer particles through stability ratio measurements" **Polymer** 46, 1157-1167 (2005).
29. P. Sandkühler, J. Sefcik, M. Morbidelli "Scaling of the kinetics of slow aggregation and gel formation for a fluorinated polymer colloid" **Langmuir** 21, 2062-2077 (2005).
30. P. Sandkühler, M. Lattuada, H. Wu, J. Sefcik, M. Morbidelli "Further insights into universality of colloidal aggregation" **Advances in Colloid and Interface Science** 113, 65-83 (2005).

31. J. Sefcik, R. Grass, P. Sandkühler, M. Morbidelli "Kinetics of aggregation and gelation in colloidal dispersions" **Chemical Engineering Research and Design** 83, 926-932 (2005).
32. M. H. Waldner, J. Sefcik, M. Soos, M. Morbidelli "Initial growth kinetics and structure of colloidal aggregates in turbulent coagulator" **Powder Technology** 156, 226-234 (2005).
33. D. L. Marchisio, M. Soos, J. Sefcik, M. Morbidelli "Role of turbulent shear rate distribution in aggregation and breakage processes" **AIChE Journal** 52, 158-173 (2006).
34. M. U. Bäbler, J. Sefcik, M. Morbidelli, J. Baldyga "Hydrodynamic interactions and orthokinetic collisions of porous aggregates in the stokes regime" **Physics of Fluids** 18, 013302 (2006).
35. D. L. Marchisio, M. Soos, J. Sefcik, M. Morbidelli, A. A. Barresi, G. Baldi "Effects of fluid dynamics on particle size distribution in particulate processes" **Chemical Engineering and Technology** 29, 191-199 (2006).
36. M. Soos, J. Sefcik, M. Morbidelli "Investigation of aggregation, breakage and restructuring kinetics of colloidal dispersions in turbulent flows by population balance modeling and static light scattering" **Chemical Engineering Science** 61, 2349-2363 (2006).
37. M. Lattuada, H. Wu, J. Sefcik, M. Morbidelli "Detailed model of the aggregation event between two fractal clusters" **Journal of Physical Chemistry B** 110, 6574-6586 (2006).
38. J. Sefcik, M. Soos, A. Vaccaro, M. Morbidelli "Effects of mixing on aggregation and gelation of nanoparticles" **Chemical Engineering and Processing** 45, 936-943 (2006).
39. A. Vaccaro, J. Sefcik, H. Wu, M. Morbidelli, J. Bobet, C. Frignant "Aggregation of concentrated polymer latex in stirred vessels" **AIChE Journal** 52, 2742-2756 (2006).
40. M. Soos, L. Wang, R. O. Fox, J. Sefcik, M. Morbidelli "Population balance modeling of aggregation and breakage in turbulent Taylor-Couette flow" **Journal of Colloid and Interface Science** 307, 433-446 (2007).
41. A. Moussa, M. Soos, J. Sefcik, M. Morbidelli "Effect of solid volume fraction on aggregation and breakage in colloidal suspensions in batch and continuous stirred tank" **Langmuir** 23, 1664-1673 (2007).
42. A. Vaccaro, J. Sefcik, M. Morbidelli "Modeling focused beam reflectance measurement and its application to sizing of particles of variable shape" **Particle & Particle Systems Characterization** 23, 360-373 (2007).
43. M. Soos, J. Sefcik, M. Morbidelli "Master curves for shear aggregation: effects of cluster structure and polydispersity" **Industrial and Engineering Chemistry Research** 46, 1709-1720 (2007).
44. M. Kroslak, J. Sefcik, M. Morbidelli "Effect of temperature, pH and salt concentration on beta-lactoglobulin deposition kinetics studied by OWLS" **Biomacromolecules** 8, 963-970 (2007).
45. Y. Frum, G. M. Khan, J. Sefcik, J. Rouse, G. M. Eccleston, V. M. Meidan "Towards a correlation between drug properties and in vitro transdermal flux variability" **International Journal of Pharmaceutics** 336, 140-147 (2007).
46. M. Soos, A. S. Moussa, L. Ehrl, J. Sefcik, H. Wu, M. Morbidelli "Effect of shear rate on the aggregates size and morphology investigated under turbulent conditions in stirred tank" **Journal of Colloid and Interface Science** 319, 577-589 (2008).

47. M. Soos, A. S. Moussa, L. Ehrl, J. Sefcik, H. Wu, M. Morbidelli "Dynamic response studies on aggregation and breakage dynamics of colloidal dispersions in stirred tanks" **Journal of Dispersion Science and Technology** 29, 605-610 (2008).
48. M. Variny, S. Alvarez de Miguel, B. D. Moore, J. Sefcik "Formation of valine microcrystals through rapid antisolvent precipitation" **Journal of Dispersion Science and Technology** 29, 617-620 (2008).
49. M. J. Heslop, C. J. Schaschke, J. Sefcik, D. J. Richardson, P. A. Russell "Measurement of adsorption of a single component from the liquid phase: modelling investigation and sensitivity analysis" **Adsorption** 14, 639-651 (2008).
50. M. Soos, M. Lattuada, J. Sefcik "Interpretation of light scattering and turbidity measurements in aggregated systems: Effect of intra-cluster multiple-light scattering" **Journal of Physical Chemistry B** 113, 14962-14970 (2009).
51. A. R. Hirst, S. Roy, M. Arora, A. K. Das, N. Hodson, P. Murray, S. Marshall, N. Javid, J. Sefcik, J. Boekhoven, J. van Esch, S. Santabarbara, N. T. Hunt, R. V. Ulijn "Biocatalytic induction of supramolecular order" **Nature Chemistry** 2, 1089-1094 (2010).
52. K. Vogtt, N. Javid, E. Alvarez, J. Sefcik, M.-C. Bellissent-Funel "Tracing nucleation pathways in protein aggregation by using small angle scattering methods" **Soft Matter** 7, 3906-3914 (2011).
53. P. Hamilton, D. Littlejohn, A. Nordon, J. Sefcik, P. Slavin, P. Dallin, J. Andrews "Studies of particle drying using non-invasive Raman spectrometry and particle size analysis" **Analyst** 136, 2168-2174 (2011).
54. N. Javid, K. Vogtt, S. Roy, A. R. Hirst, A. Hoell, I. W. Hamley, R. V. Ulijn, J. Sefcik "Supramolecular structures of enzyme clusters" **Journal of Physical Chemistry Letters** 2, 1395-1399 (2011).
55. R. Fartaria, N. Javid, R. A. Pethrick, J. J. Liggat, J. Sefcik, M. B. Sweatman "Simulation of laponite-styrene precursor dispersions for production of polymer clay nanocomposites with controlled structure" **Soft Matter** 7, 9157-9166 (2011).
56. P. Hamilton, D. Littlejohn, A. Nordon, J. Sefcik, P. Slavin "Validity of particle size analysis techniques for measurement of the attrition that occurs during vacuum agitated powder drying of needle-shaped particles" **Analyst** 137, 118-125 (2012).
57. P. Grancic, V. Illeova, M. Polakovic, J. Sefcik "Thermally induced inactivation and aggregation of urease: experiments and population balance modelling" **Chemical Engineering Science** 70, 14-21 (2012).
58. R. Fartaria, N. Javid, J. Sefcik, M. B. Sweatman "Simulation of scattering and phase behavior around the isotropic-nematic transition of discotic particles" **Journal of Colloid and Interface Science** 377, 94-104 (2012).
59. K. Sypek, I. S. Burns, A. J. Florence, J. Sefcik "In situ monitoring of stirring effects on polymorphic transformations during cooling crystallization of carbamazepine" **Crystal Growth & Design** 12, 4821-4828 (2012).
60. S. Roy, N. Javid, J. Sefcik, P. J. Halling, R. V. Ulijn "Salt-induced control of supramolecular order in biocatalytic hydrogelation" **Langmuir** 28, 16664-16670 (2012).

61. A. Jawor-Baczynska, J. Sefcik, B. D. Moore "250 nm glycine-rich nanodroplets are formed on dissolution of glycine crystals but are too small to provide productive nucleation sites" **Crystal Growth & Design** 13, 470-478 (2013).
62. K. Z. Gaca, J. Sefcik "Mechanism and kinetics of nanostructure evolution during early stages of resorcinol-formaldehyde polymerisation" **Journal of Colloid and Interface Science** 406, 51–59 (2013).
63. P. Hamilton, D. Littlejohn, A. Nordon, J. Sefcik, P. Slavin, J. Andrews, P. Dallin "Investigation of factors affecting isolation of needle-shaped particles in a vacuum agitated filter drier through non-invasive measurements by Raman spectrometry" **Chemical Engineering Science**, 101, 878-885 (2013).
64. K. Z. Gaca, J. A. Parkinson, J. Sefcik "Molecular speciation and mesoscale clustering in formaldehyde-methanol-water solutions in the presence of sodium carbonate" **Journal of Physical Chemistry B** 117, 10548-10555 (2013).
65. M. Soos, D. L. Marchisio, J. Sefcik "Assessment of gel formation in colloidal dispersions during mixing in turbulent jets" **AIChE Journal** 59, 4567-4581 (2013).
66. C. McKinstry, E. J. Cussen, A. J. Fletcher, S. V. Patwardhan, J. Sefcik "Effect of synthesis conditions on formation pathways of metal organic framework (MOF-5) crystals" **Crystal Growth & Design** 13, 5481-5486 (2013).
67. N. Javid, S. Roy, M. Zelzer, Z. Yang, J. Sefcik, R. V. Ulijn "Cooperative self-assembly of peptide gelators and proteins" **Biomacromolecules** 14, 4368-4376 (2013).
68. A. Jawor-Baczynska, B. D. Moore, H. S. Lee, A. V. McCormick, J. Sefcik "Population and size distribution of solute-rich mesospecies within mesostructured aqueous amino acid solutions" **Faraday Discussions** 167, 425-440 (2013).
69. K. Z. Gaca, J. A. Parkinson, L. Lue, J. Sefcik "Equilibrium speciation in moderately concentrated formaldehyde-methanol-water solutions investigated using ^{13}C and ^1H Nuclear Magnetic Resonance spectroscopy" **Industrial & Engineering Chemistry Research** 53, 9262-9271 (2014).
70. S. J. Taylor, M. D. Haw, J. Sefcik, A. J. Fletcher "Gelation mechanism of resorcinol-formaldehyde gels investigated by dynamic light scattering" **Langmuir** 30, 10231-10240 (2014).
71. M. Krosiak, M. Morbidelli, J. Sefcik "Effects of temperature and concentration on mechanism and kinetics of thermally induced deposition from coffee extracts" **Chemical Papers** 68, 1755-1766 (2014).
72. O. S. Agimelen, P. Hamilton, I. Haley, A. Nordon, M. Vasile, J. Sefcik, A. J. Mulholland "Estimation of particle size distribution and aspect ratio of non-spherical particles from chord length distribution" **Chemical Engineering Science** 123, 629-640 (2015).
73. C. Forsyth, P. A. Mulheran, C. Forsyth, M. D. Haw, I. S. Burns, J. Sefcik "Influence of controlled fluid shear on nucleation rates in glycine aqueous solutions" **Crystal Growth & Design** 15, 94-102 (2015).
74. J. Mosses, D. A. Turton, L. Lue, J. Sefcik, K. Wynne "Crystal templating through liquid-liquid phase separation" **Chemical Communications** 51, 1139-1142 (2015).

75. C. Tachtatzis, R. Sheridan, C. Michie, R. C. Atkinson, A. Cleary, J. Dziewierz, I. Andonovic, N. E. B. Briggs, A. J. Florence, J. Sefcik "Image-based monitoring for early detection of fouling in crystallisation processes" **Chemical Engineering Science** 133, 82-90 (2015).
76. A. Jawor-Baczynska, B. D. Moore, J. Sefcik "Effect of mixing, concentration and temperature on the formation of mesostructured solutions and their role in the nucleation of DL-valine crystals" **Faraday Discussions** 179, 141-154 (2015).
77. T. McGlone, N. E. B. Briggs, C. A. Clark, C. J. Brown, J. Sefcik, A. J. Florence "Oscillatory flow reactors (OFRs) for continuous manufacturing and crystallization" **Organic Process Research & Development** 19, 1186-1202 (2015).
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81. C. McKinstry, R. J. Cathcart, E. J. Cussen, A. J. Fletcher, S. V. Patwardhan, J. Sefcik "Scalable continuous solvothermal synthesis of metal organic framework (MOF-5) crystals" **Chemical Engineering Journal** 285, 718-725 (2016).
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83. O. S. Agimelen, A. Jawor-Baczynska, J. McGinty, J. Dziewierz, C. Tachtatzis, A. Cleary, I. Haley, C. Michie, I. Andonovic, J. Sefcik, A. J. Mulholland "Integration of in situ imaging and chord length distribution measurements for estimation of particle size and shape" **Chemical Engineering Science** 144, 87-100 (2016).
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85. O. S. Agimelen, A. J. Mulholland, J. Sefcik "Modelling of artefacts in estimations of particle size of needle-like particles from laser diffraction measurements" **Chemical Engineering Science** 158, 445-452 (2017).
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- opportunities between reactive and antisolvent crystallization concepts" **Crystal Growth & Design** 17, 1902-1909 (2017).
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Prednášky na medzinárodných konferenciách

1. "Singular perturbation analysis of tubular recycle reactors", 4th World Congress of Chemical Engineering (Process Optimization and Control Session), Karlsruhe, Nemecko, 1991.
2. "Modeling of tubular reactors with recycle", 18th Conference of the Czechoslovak Society of Chemical Engineering, Vyhne, Slovensko, 1991.
3. "Complicated dynamics in reaction-diffusion systems with a non-local term", 1st World Congress of Nonlinear Analysis (Dynamics of Parabolic PDEs Session), Tampa, USA, 1992.
4. "Zeolite synthesis modeling: Effect of composition", 13th North American Meeting of the Catalysis Society (Zeolite Synthesis and Characterization Session) Pittsburgh, USA, 1993.
5. "Molecular sieve synthesis modeling", 11th International Congress of Chemical Engineering, Chemical Equipment, Design and Automation - CHISA (Reaction Engineering Session), Praha, Česká Republika, 1993.
6. "Zeolite synthesis dynamics in batch reactors", 1993 AIChE Annual Meeting (Chemical Reactor Stability and Dynamics Session), St. Louis, USA, 1993.

7. "Self-assembly of aluminosilicates in aqueous solutions and zeolite synthesis dynamics", Materials Research Society Fall Meeting (Complex Fluids Session), Boston, USA, 1993.
8. "Dynamics of zeolite crystallization", 1994 American Institute of Chemical Engineers Spring National Meeting (Fundamentals and Application of Parameter Estimation and Control of Crystallization Processes Session), Atlanta, USA, 1994.
9. "Control of reaction kinetics and precipitation in sol-gel synthesis", 1997 American Chemical Society Annual Meeting (Sol-Gel Synthesis of Catalysts and Advanced Materials Symposium), San Francisco, USA, 1997.
10. "Modeling of oxides with dynamic charge equilibration method", 1998 American Institute of Chemical Engineers Annual Meeting (Molecular Simulation - Development of Potential Models Session), Miami, USA, 1998.
11. "Dynamic charge equilibration force fields for modeling sorbents and catalysts", 1999 American Chemical Society Annual Meeting (Atomistic Simulation of Diffusion and Reaction in Zeolites), Anaheim, USA, 1999.
12. "DFT calculations of silanol isoelectric points for reaction engineering of alkoxysilane polymerization", 1999 American Chemical Society Annual Meeting (Bridging the Gap between Chemical Modeling and Engineering), Anaheim, USA, 1999.
13. "Reactivity of vanadium activated oxygens towards dihydrogen: a small cluster density functional study", 1999 American Institute of Chemical Engineers Annual Meeting (Applying Molecular Simulations and Computational Quantum Chemistry Session), Dallas, USA, 1999.
14. "Reaction engineering approach to zeolite synthesis modeling", 27th International Conference of the Slovak Society of Chemical Engineering (plenárna prednáška), Tatranské Matliare, Slovensko, 2000.
15. "Particle aggregation in polymer latexes", 74th Colloid and Surface Science Symposium (Polymer Colloids Symposium), Lehigh University, Bethlehem, USA, 2000.
16. "Prediction of crystallization diagrams for synthesis of zeolites", 14th International Congress of Chemical and Process Engineering - CHISA (Reaction Engineering Session, keynote lecture), Praha, Česká Republika, 2000.
17. "Modeling silica zeolites with dynamic charge equilibration method", 14th International Congress of Chemical and Process Engineering - CHISA (Symposium on sorption, mass transport and catalytic phenomena in microporous membranes and related materials), Praha, Česká Republika, 2000.
18. "Computational thermochemistry of silicates in aqueous solutions", 2000 American Institute of Chemical Engineers Annual Meeting (Thermodynamics of Aqueous and Ionic Systems Session), Los Angeles, USA, 2000.
19. "Particle aggregation in polymer latexes", 2000 American Institute of Chemical Engineers Annual Meeting (Particle/Particle Interactions in Fluid/Particle Systems Session), Los Angeles, USA, 2000.
20. "Monitoring ion adsorption and desorption on aqueous oxide surfaces using optical waveguide lightmode spectroscopy", 75th Colloid and Surface Science Symposium (Interfacial Processes in Water Environment Session), Carnegie Mellon University, Pittsburgh, USA, 2001.
21. "Charging behavior of surfactant stabilized polystyrene latexes", 75th Colloid and Surface Science Symposium (Colloidal Stability and Aggregation Dynamics Session), Carnegie Mellon University, Pittsburgh, USA, 2001.
22. "Aggregation kinetics in colloidal dispersions", 29th International Conference of the Slovak Society of Chemical Engineering (Reactors Session), Tatranské Matliare, Slovensko, 2002.
23. "Aggregation kinetics in colloidal dispersions: discrimination among aggregation kernels", 76th Colloid and Surface Science Symposium (Colloidal Phenomena Session), University of Michigan, Ann Arbor, USA, 2002.
24. "Kinetics of gelation in colloidal dispersions", International Workshop Attractive Interactions in Colloidal Systems, Bad Gastein, Rakúsko, 2003.

25. "Aggregation and gelation in colloidal dispersions", 11th Annual Meeting of the Swiss Group of Colloid and Interface Science, Marly, Švajčiarsko, 2003.
26. "Reachability and control of mean particle size and fractal dimension in turbulent aggregation", 2003 American Institute of Chemical Engineers Annual Meeting (Population Balance Modeling in Particle Formation Processes Session), San Francisco, USA, 2003.
27. "Kinetics of slow irreversible aggregation and gelation in moderately concentrated dispersions", 2003 American Institute of Chemical Engineers Annual Meeting (Fundamentals of Interfacial Phenomena Session), San Francisco, USA, 2003.
28. "Reachability analysis and control of turbulent aggregation", Swiss Symposium on Crystallization and Precipitation, Zürich, Švajčiarsko, 2004.
29. "Turbulent aggregation in colloidal dispersions", International Congress for Particle Technology PARTEC2004 (Colloids Processing Session), Nürnberg, Nemecko, 2004.
30. "Surface charging and colloidal stability of particles stabilized by anionic surfactants", International Congress for Particle Technology PARTEC2004 (Charges and Particles Session), Nürnberg, Nemecko, 2004.
31. "Aggregation kinetics and structure of nanoparticle clusters", 78th Colloid and Surface Science Symposium (Dynamic Behavior of Complex Fluids Session), Yale University, New Haven, USA, 2004.
32. "Domain formation through gelation of nanoparticles", 78th Colloid and Surface Science Symposium (Synthesis and Applications of Nanoparticles and Nanostructures Session), Yale University, New Haven, USA, 2004.
33. "Reachability analysis and control of turbulent coagulator", 16th International Congress of Chemical and Process Engineering - CHISA (Simulation, Optimization and Control Session), Praha, Česká Republika, 2004.
34. "Colloidal behavior of emulsion polymers in their post-processing" 8th International Workshop on Polymer Reaction Engineering (pozvaná plenárna prednáška), Hamburg, Nemecko, 2004.
35. "Effects of mixing on aggregation of nanoparticles in turbulent flows", 2004 American Institute of Chemical Engineers Annual Meeting (Multi-scale and Population Balance Modeling of Particle Technology for Materials Processing Session), Austin, USA, 2004.
36. "Colloidal interactions, aggregation and gelation of nanoparticles" 2nd International Max Planck Symposium on Particulate Processes (pozvaná plenárna prednáška), Magdeburg, Nemecko, 2004.
37. "Kinetics of Aggregation and Gelation in Colloidal Dispersions: Towards Novel Macroporous Materials for Bioprocessing", 7th World Congress of Chemical Engineering (Interfacial and Colloidal Phenomena Session), Glasgow, Veľká Británia, 2005.
38. "Competition between mixing and gelation: continuous processing of nanoparticle dispersions", 2005 American Institute of Chemical Engineers Annual Meeting (Modeling and Scale-Up of Nanoparticle Processing Session), Cincinnati, USA, 2005.
39. "Engineering of nanoparticle gelation for design of functional porous materials", Materials Congress 2006 (Chemical Design & Synthesis of New Functional Materials Session), London, Veľká Británia, 2006.
40. "Particle characterization in aggregating colloidal dispersions: what can we learn from turbidity and static light scattering", 5th World Congress of Particle Technology (Selected Topics in Particle and Powder Characterization Session), Orlando, USA, 2006.
41. "Modelling activation energy of zeolite growth: interplay between thermodynamics and kinetics", 29th Annual Meeting of the British Zeolite Association, Ambleside, Veľká Británia, 2006.
42. "Turbidity spectra and light scattering in Mie regime for monitoring of particle formation processes", 2006 American Institute of Chemical Engineers Annual Meeting (Particle Formation and Crystallization Processes from Liquids or Slurry Session), San Francisco, USA, 2006.
43. "Temperature and pH effects on deposition kinetics of beta-lactoglobulin", 2006 American Institute of Chemical Engineers Annual Meeting (Biomolecules at Interfaces Session), San Francisco, USA, 2006.

44. "Dynamic response studies of aggregation and breakage dynamics in colloidal dispersions in stirred tanks", 1st International Conference on Industrial Processes for Nano and Micro Products, London, Veľká Británia, 2007.
45. "Formation of valine microcrystals through rapid antisolvent precipitation", 1st International Conference on Industrial Processes for Nano and Micro Products, London, Veľká Británia, 2007.
46. "Population balance modeling of protein aggregation: Towards understanding non-integer order kinetics of protein denaturation", 2007 American Institute of Chemical Engineers Annual Meeting (Thermodynamics of Protein Folding and Aggregation Session), Salt Lake City, USA, 2007.
47. "Particle formation pathways in antisolvent precipitation processes", 2007 American Institute of Chemical Engineers Annual Meeting (Particle Formation and Crystallization Processes from Liquids, Slurries and Emulsions Session), Salt Lake City, USA, 2007.
48. "Assessment of flow sensitivity of breakage and attrition in crystal suspensions", 2008 American Institute of Chemical Engineers Annual Meeting (Advances and Case Studies in Crystallization and Post Crystallization Processing Session), Philadelphia, USA, 2008.
49. "Particle formation processes in pharmaceutical crystallisation", Advances in Process Analytics and Control Technologies (APACT) 2009, Glasgow, Veľká Británia, 2009.
50. "Kinetics of protein denaturation: population balance modeling and experiments", 4th International Conference on Population Balance Modeling, Berlin, Nemecko, 2010.
51. "Nanodroplet intermediates on a molecular crystallization pathway", 2010 American Institute of Chemical Engineers Annual Meeting (Particle Formation and Crystallization Processes from Liquids, Slurries, and Emulsions Session), Salt Lake City, USA, 2010.
52. "Monitoring of polymorphic outcome in cooling crystallization of carbamazepine under various flow conditions", 2nd European Conference on Process Analytics and Control Technology (EuroPACT 2011), Glasgow, Veľká Británia, 2011.
53. "Nanoscale clustering and nucleation pathways in crystallisation of alpha-glycine", BACG 2011 Annual Conference (pozvaná plenárna prednáška), London, Veľká Británia, 2011.
54. "Influence of rapid initial mixing on particle formation kinetics in antisolvent crystallisation", 18th International Symposium on Industrial Crystallization (Fundamentals of Crystallization Session), Zürich, Švajčiarsko, 2011.
55. "Towards continuous crystallisation in pharmaceutical manufacturing", 39th International Conference of Slovak Society of Chemical Engineering (pozvaná plenárna prednáška), Tatranské Matliare, Slovensko, 2012.
56. "Control of nucleation for continuous production of seeding crystal suspensions", APS PharmSci 2013 Conference (pozvaná hlavná prednáška), Edinburgh, Veľká Británia, 2013.
57. "Populations and size distributions of mesoscale clusters in aqueous amino acid solutions", Faraday Discussion 167 (pozvaná prednáška), Bristol, Veľká Británia, 2013.
58. "Populations and size distributions of mesoscale clusters in aqueous amino acid solutions and their role in crystal nucleation", 19th International Symposium on Industrial Crystallization (Fundamentals of Crystallization Science Session), Toulouse, Francúzsko, 2014.
59. "Effect of mixing, concentration and temperature on formation of mesostructured solutions and their role in nucleation of DL-valine crystals", Faraday Discussion 179 (pozvaná prednáška), Leeds, Veľká Británia, 2015.
60. "Influence of shear rate and surface area on nucleation kinetics: evidence for non-classical nucleation mechanisms", 5th European Conference on Crystal Growth (Mesocrystals and Nonclassical Crystallisation), Bologna, Taliansko, 2015.
61. "Effects of flow on primary nucleation and non-classical nucleation mechanisms", COST Action CM1402 Crystallize Annual Meeting (pozvaná prednáška), Coimbra, Portugalsko, 2016.
62. "Effect of flow on primary nucleation and non-classical nucleation mechanisms", 12th International Workshop of the Crystal Growth of Organic Materials (CGOM12) (plenárna prednáška), Leeds, Veľká Británia, 2016.

63. "Continuous Multicomponent Crystallization: Salts, co-crystals and solid solutions", Association for Crystallization Technology 21st Larson Workshop (pozaná prednáška), Princeton, USA, 2016.
64. "Interplay between physics and chemistry in sol-gel process", 19th International Sol-Gel Conference (pozaná plenárna prednáška), Liege, Belgicko, 2017.
65. "Combining data from different in-situ tools to estimate (more) real particle size and shape", Crystallization Symposium 2017 (pozaná prednáška), Basel, Švajčiarsko, 2017.
66. "Decoupling primary and secondary nucleation", BACG 2018 Annual Conference (pozaná plenárna prednáška), Limerick, Írsko, 2018.
67. "Effects of fluid flow on primary and secondary nucleation in crystallization processes", 2022 American Institute of Chemical Engineers Annual Meeting (Plenary Session: Crystallization and Evaporation, pozvaná hlavná prednáška pri príležitosti prevzatia ceny sekcie AIChE), Phoenix, USA, 2022.

Glasgow, 6/12/2024



Ján Šefčík