Publications

Johan Wärnå

Books and Book chapters


Salmi, T., Murzin, D., Mäki-Arvela, P., Wärnå, J., Eränen, K., Kumar, N., Mikkola, J.-P., Chemical reaction engineering in the catalytic processing of biomass into chemicals, in Novel concepts in catalysis and chemical reactors (Ed. A. Cybulski, J.A. Moulijn, A. Stankiewicz), Wiley

Articles in international scientific journals with referee practice


21. H. Grenman, T. Salmi, P. Mäki-Arvela, J. Wärnå, K. Eränen, E. Tirronen, A. Pehkonen, Modelling the Kinetics of a Reaction Involving a Sodium Salt of 1,2,4-Triazole and a Complex Substituted Aliphatic Halide, Organic Process Research & Development (Accepted)


42. Roslund, Mattias U.; Aitio, Olli; Warna, Johan; Maaheimo, Hannu; Murzin, Dmitry Yu.; Leino, Reko. Acyl Group Migration and Cleavage in Selectively Protected b-D-Galactopyranosides as Studied by NMR Spectroscopy and Kinetic Calculations. Journal of the American Chemical Society (2008), 130(27), 8769-8772


44. Kuusisto, Jyrki; Mikkola, Jyri-Pekka; Sparv, Mona; Warna, Johan; Karhu, Hannu; Salmi, Tapio. Kinetics of the catalytic hydrogenation of D-lactose on a carbon supported ruthenium catalyst. Chemical Engineering Journal (Amsterdam, Netherlands) (2008), 139(1), 69-77.


51. Leveneur, S., Salmi, T., Murzin, D. Yu., Estel, L., Wärnå, J., Musakka, N., Kinetic study and modeling of peroxypropionic acid synthesis from propionic acid and


67. Bernas, Andreas; Warna, Johan; Maki-Arvela, Paivi; Murzin, Dmitry Yu; Salmi, Tapio Kinetics and mass transfer in hydroformylation - bulk or film reaction? Canadian Journal of Chemical Engineering (2010), 88(4), 618-624


69. Salmi, Tapio; Grenman, Henrik; Bernas, Heidi; Waerna, Johan; Murzin, Dmitry Yu Mechanistic modelling of kinetics and mass transfer for a solid-liquid system: Leaching of zinc with ferric iron. Chemical Engineering Science (2010), 65(15), 4460-4471.

70. Jogunola, Olatunde; Salmi, Tapio; Eranen, Kari; Warna, Johan; Kangas, Matias; Mikkola, J.-P. Reversible Autocatalytic Hydrolysis of Alkyl Formate: Kinetic and Reactor Modeling Industrial & Engineering Chemistry Research (2010), 49(9), 4099-4106.


73. Grenman, Henrik; Warna, Johan; Mikkola, J.-P.; Sifontes, Victor; Fardim, Pedro; Murzin, Dmitry Yu.; Salmi, Tapio, Modeling the Influence of Wood Anisotropy and Internal Diffusion on Delignification Kinetics From Industrial & Engineering Chemistry Research (2010), 49(20), 9703-9711.

74. Eta, Valerie; Maeki-Arvela, Paeivi; Waerna, Johan; Salmi, Tapio; Mikkola, Jyri-Pekka; Murzin, Dmitry Yu. Kinetics of dimethyl carbonate synthesis from methanol and carbon dioxide over ZrO2-MgO catalyst in the presence of butylene oxide as additive. Applied Catalysis, A: General (2011), 404(1-2), 39-46

75. Grenman, Henrik; Ingves, Malin; Waerna, Johan; Corander, Jukka; Murzin, Dmitry Yu.; Salmi, Tapio Common potholes in modeling solid-liquid reactions - methods for avoiding them,Chemical Engineering Science (2011), 66(20), 4459-4467.

76. Handjani, Soraya; Marceau, Eric; Blanchard, Juliette; Krafft, Jean-Marc; Che, Michel; Maeki-Arvela, Paeivi; Kumar, Narendra; Waerna, Johan; Murzin, Dmitry Yu.,Influence of the support composition and acidity on the catalytic properties of mesoporous SBA-15, Al-SBA-15, and Al2O3-supported Pt catalysts for cinnamaldehyde hydrogenation Journal of Catalysis (2011), 282(1), 228-236.
77. Jogunola, Olatunde; Salmi, Tapio; Eranen, Kari; Waerna, Johan; Mikkola, J.-P. Rates and equilibria of ester hydrolysis: Combination of slow and rapid reactions, Chemical Engineering and Processing (2011), 50(7), 665-674.


80. Salmi, Tapio; Grenman, Henrik; Waerna, Johan; Murzin, Dmitry Yu., Revisiting shrinking particle and product layer models for fluid-solid reactions - From ideal surfaces to real surfaces, Chemical Engineering and Processing (2011), 50(10), 1076-1084.

81. Nduagu, Experience; Bjoerkloef, Thomas; Fagerlund, Johan; Waerna, Johan; Geerlings, Hans; Zevenhoven, Ron, Production of magnesium hydroxide from magnesium silicate for the purpose of CO2 mineralisation - Part 1: Application to Finnish serpentinite, Minerals Engineering (2012), 30, 75-86.

82. Riittonen, Toni; Toukonitty, Esa; Madhani, Dipak Kumar; Leino, Anne-Riikka; Kordas, Krisztian; Szabo, Maria; Sapi, Andras; Arve, Kalle; Warna, Johan; Mikkola, Jyri-Pekka, One-pot liquid-phase catalytic conversion of ethanol to 1-butanol over aluminium oxide - the effect of the active metal on the selectivity, Catalysts (2012), 2(1), 68-84.

83. Jogunola Olatunde; Salmi, Tapio; Waerna, Johan; Mikkola, Jyri-Pekka, Kinetic studies of alkyl formate hydrolysis using formic acid as a catalyst, Journal of Chemical Technology and Biotechnology (2012), 87(2), 286-293.


86. Salmi, Tapio; Murzin, Dmitry Yu.; Waerna, Johan; Maki-Arvela, Paivi; Martin, Gerson, Integrated modelling of reaction and catalyst deactivation kinetics-Hydrogenation of sitosterol to sitostanol over a palladium catalyst, Chemical Engineering Science (2013), 104, 156-165.

87. Salmi, Tapio; Grennan, Henrik; Waerna, Johan; Murzin, Dmitry Yu., New modelling approach to liquid-solid reaction kinetics: From ideal particles to real particles, Chemical Engineering Research and Design (2013), 91(10), 1876-1889.

89. Schmidt, Sabrina A.; Kumar, Narendra; Reinsdorf, Arne; Eranen, Kari; Warna, Johan; Murzin, Dmitry Yu.; Salmi, Tapio, Methyl chloride synthesis over Al2O3 catalyst coated microstructured reactor-Thermodynamics, kinetics and mass transfer, Chemical Engineering Science (2013), 95, 232-245.

90. Salmi, Tapio; Hernandez Carucci, Jose; Roche, Mauricio; Eranen, Kari; Warna, Johan; Murzin, Dmitry, Microreactors as tools in kinetic investigations: Ethylene oxide formation on silver catalyst, Chemical Engineering Science (2013), 87, 306-314.

91. Martin, Gerson; Maki-Arvela, Paivi; Warna, Johan; Murzin, Dmitry Yu.; Salmi, Tapio, Enantioselective Hydrogenation of Ethyl Benzoyleformate, from Mechanism and Kinetics to Continuous Reactor Technology, Topics in Catalysis (2014), Ahead of Print.


95. Durante, Davide; Kilpio, Teuvo; Suominen, Petteri; Herrera, Victor Sifontes; Warna, Johan; Canu, Paolo; Salmi, Tapio, Modeling and simulation of a small-scale trickle bed reactor for sugar hydrogenation, Computers & Chemical Engineering (2014), 66, 22-35.

96. Kirilin, Alexey; Warna, Johan; Tokarev, Anton; Murzin, Dmitry Yu., Kinetic Modeling of Sorbitol Aqueous-Phase Reforming over Pt/Al2O3 Industrial & Engineering Chemistry Research (2014), 53(12), 4580-4588.

97. Leveneur, Sebastien; Zheng, Junliu; Taouk, Bechara; Burel, Fabrice; Warna, Johan; Salmi, Tapio, Interaction of thermal and kinetic parameters for a liquid-liquid reaction system: Application to vegetable oils epoxidation by peroxycarboxylic acid, Journal of the Taiwan Institute of Chemical Engineers (2014), 45(4), 1449-1458

98. Salmi, Tapio; Murzin, Dmitry Yu.; Maeki-Arvela, Paeivi; Kusema, Bright; Holmnbom, Bjarne; Willfoer, Stefan; Waerna, Johan, Kinetic modeling of hemicellulose hydrolysis in the presence of homogeneous and heterogeneous catalysts, AIChE Journal (2014), 60(3), 1066-1077.

99. Simakova, Olga A.; Murzina, Elena V.; Warna, Johan; Murzin, Dmitry Yu., Kinetics of the selective oxidation of the lignan hydroxymatairesinol to oxomatairesinol over Au/Al2O3 catalysts, Journal of Molecular Catalysis A: Chemical (2014), 388-389, 154-161


101. Salminen, Eero; Maki-Arvela, Paivi; Virtanen, Pasi; Salmi, Tapio; Warna, Johan; Mikkola, Jyri-Pekka, Kinetics upon Isomerization of α,β-Pinene Oxides over
102. Salmi, Tapio; Murzin, Dmitry; Warna, Johan; Maki-Arvela, Paivi; Kusema, Bright; Holmbom, Bjarne; Willfor, Stefan, Hemicellulose Hydrolysis in the Presence of Heterogeneous Catalysts, Topics in Catalysis (2014), 57(17-20), 1470-1475.

103. Savela, Risto; Warna, Johan; Murzin, Dmitry Yu.; Leino, Reko, Iron catalyzed halogenation of benzylic aldehydes and ketones, Catalysis Science & Technology (2015), Accepted

104. Langvik, Otto; Sandberg, Thomas; Warna, Johan; Murzin, Dmitry Yu.; Leino, Reko, One-pot synthesis of (R)2-acetoxy-1-indanone from 1, 2-indanedione combining metal catalyzed hydrogenation and chemoenzymatic dynamic kinetic resolution, Catalysis Science & Technology (2015), 5(1), 150-160

105. Kinetics of the One-Pot Transformation of Citronellal to Menthols on Ru/H-BEA Catalysts Ploesser, Jutta; Lucas, Martin; Warna, Johan; Salmi, Tapio; Murzin, Dmitry Yu.; Claus, Peter, Organic Process Research & Development (2016), 20(9), 1647-1653.


107. Dynamic modelling of homogeneously catalysed glycerol hydrochlorination in bubble column reactor, de Araujo Filho, Cesar A.; Mondal, Debanga; Haase, Stefan; Warna, Johan; Eranen, Kari; Mikkola, Jyri-Pekka; Salmi, Tapio, Chemical Engineering Science (2016), 149, 277-295

108. Mathematical modeling of starch oxidation by hydrogen peroxide in the presence of an iron catalyst complex, Salmi, Tapio; Tolvanen, Pasi; Warna, Johan; Maki-Arvela, Paivi; Murzin, Dmitry; Sorokin, Alexander, Chemical Engineering Science (2016)

109. Reaction kinetics with catalyst deactivation in simultaneous esterification and transesterification of acid oils to biodiesel (FAME) over a mesoporous sulphonated carbon catalyst, Konwar, Lakhya Jyoti; Warna, Johan; Maki-Arvela, Paivi; Kumar, Narendra; Mikkola, Jyri-Pekka, Fuel (2016), 166, 1-11


112. Transformation of tetramethyl disiloxane in used oil alkali treatment conditions: mechanism and kinetic modeling, Kupareva, Antonina; Warna, Johan; Grenman, Henrik; Murzin, Dmitry Yu Journal of Chemical Technology and Biotechnology (2016), 91(1), 105-112.
First, second and nth order autocatalytic kinetics in continuous and discontinuous reactors, Russo, Vincenzo; Salmi, Tapio; Mammitzsch, Frank; Jogunola, Olatunde; Lange, Rudiger; Warna, Johan; Mikkola, Jyri-Pekka, Chemical Engineering Science (2017), 172, 453-462.


Kinetics and modelling of furfural oxidation with hydrogen peroxide over a fibrous heterogeneous catalyst: effect of reaction parameters on yields of succinic acid, Saleem, Farhan; Mueller, Pia; Eraenen, Kari; Warna, Johan; Murzin, Dmitry Yu; Salmi, Tapio, Journal of Chemical Technology and Biotechnology (2017), 92(9), 2206-2220.

Hydrodeoxyxygenation of stearic acid and tall oil fatty acids over Ni-alumina catalysts: Influence of reaction parameters and kinetic modelling, Jenistova, Klara; Hachemi, Imame; Maki-Arvela, Paivi; Kumar, Narendra; Peurla, Markus; Capek, Libor; Warna, Johan; Murzin, Dmitry Yu., Chemical Engineering Journal (Amsterdam, Netherlands) (2017), 316, 401-409.


Influence of gas-liquid mass transfer on kinetic modeling: Carbonation of epoxidized vegetable oils, Cai, Xiaoshuang; Zheng, Jun Liu; Warna, Johan; Salmi, Tapio; Taouk, Bechara; Leveneur, Sebastien, Chemical Engineering Journal (Amsterdam, Netherlands) (2017), 313, 1168-1183.

Direct amination of dodecanol with NH3 over heterogeneous catalysts. Catalyst screening and kinetic modelling, Ruiz, Doris; Aho, Atte; Saloranta, Tiina; Eranen, Kari; Warna, Johan; Leino, Reko; Murzin, Dmitry Yu., Chemical Engineering Journal (Amsterdam, Netherlands) (2017), 307, 739-749.

Isomerization of α-Pinene Oxide: Solvent Effects, Kinetics and Thermodynamics, Maki-Arvela, Paivi; Shcherban, Nataliya; Lozachmeur, Chloe; Russo, Vincenzo; Warna, Johan; Murzin, Dmitry Yu., Catalysis Letters (2018).

Ketonization kinetics of stearic acid, Murzin, Dmitry Yu.; Bernas, Andreas; Warna, Johan; Myllyoja, Jukka; Salmi, Tapio, Reaction Kinetics, Mechanisms and Catalysis (2018).

Kinetics of Catalytic Wet Peroxide Oxidation of Phenolics in Olive Oil Mill Wastewaters over Copper Catalysts, Maduna, Karolina; Kumar, Narendra; Aho, Atte;

125. Production of Cycloalkanes in Hydrodeoxygenation of Isoeugenol Over Pt- and Ir-Modified Bifunctional Catalysts, Bomont, Louis; Alda-Onggar, Moldir; Fedorov, Vyacheslav; Aho, Atte; Peltonen, Janne; Eraenen, Kari; Peurla, Markus; Kumar, Narendra; Warna, Johan; Russo, Vincenzo; et al, European Journal of Inorganic Chemistry (2018), 2018(24), 2841-2854.


127. Vanillin Hydrodeoxygenation: Kinetic Modelling and Solvent Effect, Sulman, Alexandrinya; Maki-Arvela, Paivi; Bomont, Louis; Fedorov, Vyacheslav; Alda-Onggar, Moldir; Smets, Annika; Hemming, Jarl; Russo, Vincenzo; Warna, Johan; Kaldstrom, Mats; et al, Catalysis Letters (2018), 148(9), 2856-2868.


129. Catalytic oxidation kinetics of arabinose on supported gold nanoparticles, Correia, Leolincoln S.; Grenman, Henrik; Warna, Johan; Salmi, Tapio; Murzin, Dmitry Yu., Chemical Engineering Journal (Amsterdam, Netherlands) (2019), 370, 952-961.

130. Kinetic modelling of Prileschajew epoxidation of oleic acid under conventional heating and microwave irradiation, Vajglova, Zuzana; Hemery, Remi; Kumar, Narendra; Eraenen, Kari; Peurla, Markus; Peltonen, Janne; Warna, Johan; Perez-Ramirez, Javier; Murzin, Dmitry Yu.; Salmi, Tapio, Journal of Catalysis (2019), 372, 287-298.


132. Preparion of salt particles, precipitated calcium carbonate, Mikkola, Jyri-Pekka; Murzin, Dmitri; Salmi, Tapio; Warna, Johan; Fagerholm, Mats; Snaare, Mathias; Aldea, Steliana; Eraenen, Kari; Grenman, Henrik, Finn. (2019), FI 127761 B 20190215.

Articles in international compilation works and in international scientific conference proceedings with referee practice

6. Rönnholm, M. R., Wärnå, J., Salmi, T., Turunen, I., Luoma, M., Oxidation Kinetics of Ferrosulphate Over Active Carbon, 8th Nordic Symposium on Catalysis, Oslo, Norway


34. Leveneur, S., Salmi, T., Murzin, D. Yu., Wärnå, J., Peroxypropionic acid synthesis from propionic acid and hydrogen peroxide with homogeneous and heterogeneous catalysts,


42. Tapio Salmi, Jyrki Kuusisto, Johan Wärnå, Jyri-Pekka Mikkola, Detailed kinetic analysis reveals the true reaction path: catalytic hydrogenation, hydrolysis and isomerization of lactose, Catalysis of Organic Reactions (2008)
60. Jogunola, O. Z., Wärnå, J., Mikkola, J.-P., Salmi, T., Modelling of reversible autocatalytic reaction in the presence of complexation agents, EuropaCat IX, Catalysis for a Sustainable World, 30 August-4 September 2009, Salamanca, Spain
65. Salmi, T., Bernas, A., Wärnå, J., Mäki-Arvela, P., Murzin, D. Yu., Kinetics and mass transfer in hydroformylation - bulk or film reaction?, 8th World Congress of Chemical Engineering (WCCE8), Montréal, Canada August 23 to 27, 2009

70. N. Bukhanko, W. Larsson, A. Samikannu, J. Wärnå, J.-P. Mikkola Gas phase synthesis of isopropyl chloride from isopropanol and HCl over alumina catalysts. (Umea Univ., SE; 1Abo Akad. Univ., Turku, FI) [1201], CHISA-2014


B Other scientific publications, such as articles in scientific journals, and conference proceedings without referee practice, and publications in university and department series.

4. TkT Tapio Salmi ja TkT Johan Wärnå, Manifaasioperointi ja Heteroegeniset Reaktorit, (Report, Åbo Akademi, 1999)
7. L.-E. Lindfors, F. Klingstedt, K. Eränen, J. Wärnå, Kinetics of the Direct NOX Reduction over Ag/Alumina by a Higher Hydrocarbon in Excess of Oxygen,
KnowNOx. Growth Project GRD1-1999-10957 (mid term assessment report, 01.01-30.06.2001)

8. Salmi, Tapio, Mikkola, Jyri-Pekka, Wärnå Johan, Bridging Chemical Reactor and Reaction Engineering, Textbook manuscript (theory, exercises and solutions to exercises), Laboratory of Industrial Chemistry, Åbo Akademi (2004)


Newspaper articles and other popular scientific output

Jyri-Pekka Mikkola, Johan Wärnå, Kemiallinen reaktiotekniikka – modernin prosessikemian työhevonen. Saavista nurkassa ensimmäisiin kemiantehtaisiin, Turun Sanomat 5.6.2006