

## Bastian J. M. Etzold

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Technische Universität Darmstadt  
Ernst-Berl-Institut für Technische und  
Makromolekulare Chemie  
Alarich-Weiss-Straße 8  
64287 Darmstadt  
Germany

etzold@tc1.tu-darmstadt.de  
+49 (6151) 1629984

www.etzoldlab.de

ORCID: 0000-0001-6530-4978  
ResearcherID: B-9433-2008



## Publications

### Articles:

- [47] M. Munoz, G.-R. Zhang, B.J.M. Etzold, "Exploring the role of the catalytic support sorption capacity on the hydrodechlorination kinetics by the use of carbide-derived carbons". *Appl. Catal., B* (online available)
- [46] I. Simakova, Y. Demidova, J. Glaesel, E. Murzina, T. Schubert, I. Prosvirin, B.J.M. Etzold and D. Murzin, "Controlled synthesis of PVP-based carbon supported Ru nanoparticles: synthesis approaches, characterization, capping agent removal and catalytic behavior". *Catal. Sci. Technol.* (online available)
- [45] M. Munoz, S. Ponce, G.-R. Zhang and B.J.M. Etzold, "Size-controlled PtNi nanoparticles as highly efficient catalyst for hydrodechlorination reactions". *Appl. Catal., B* **192**, 1-7 (2016).
- [44] J. Lemus, J. Bedia, L. Calvo, I. Simakova, D. Murzin, B.J.M. Etzold, J.J. Rodriguez and M.A. Gilarranz "Improved synthesis and hydrothermal stability of Pt/C catalysts based on size-controlled nanoparticles". *Catal. Sci. Technol.* **6**, 5196-5206 (2016).
- [43] A.M. Kern, B. Zierath, T. Fey and B.J.M. Etzold "Thermal and electrical conductivity of amorphous and graphitized carbide-derived carbon monoliths". *Chem. Eng. Technol.* **39**, 1121-1129 (2016).
- [42] A. Weiß, M. Munoz, A. Haas, F. H. Rietzler, H-P. Steinrück, M. Haumann, P. Wasserscheid, and B. J.M. Etzold "Boosting the activity in SILP catalyzed hydroformylation via surface functionalization of the carbon support". *ACS Catal.* **6**, 2280-2286 (2016).
- [41] A.M. Kern, B. Zierath, T. Fey and B.J.M. Etzold "Adsorption of nickel ions on oxygen functionalized carbons". *Chem. Eng. Technol.* **39**, 715-722 (2016).
- [40] G.-R. Zhang, and B.J.M. Etzold "Ionic liquids in electrocatalysis". *J. Energ. Chem.* **25**, 199–207 (2016).

- [39] H. Klefer, M. Munoz, A. Modrow, B. Böhringer, P. Wasserscheid, and B.J.M. Etzold "Polymer-based spherical activated carbon as easy-to-handle catalyst support for hydrogenation reactions". *Chem. Eng. Tech.* **39**, 276 (2016).
- [38] M. Munoz, M. Kaspereit, and B.J.M. Etzold "Deducing kinetic constants for the hydrodechlorination of 4-chlorophenol using high adsorption capacity catalysts ". *Chem. Eng. J.* **285**, 228 (2016).
- [37] T. Ariyanto, A.M. Laziz, J. Gläsel, G.-R. Zhang, J. Garbes and B.J.M. Etzold "Producing High Quality Carbide-Derived Carbon from Low Quality Byproducts Stemming from SiC Production ". *Chem. Eng. J.* **283**, 676 (2016).
- [36] F. Heym, W. Korth, B.J.M. Etzold, C. Kern and Andreas Jess "Determination of vapor pressure and thermal decomposition using thermogravimetric analysis". *Thermochimica Acta* **622**, 9-17 (2015).
- [35] G.-R. Zhang, M. Munoz, and B.J.M. Etzold "Accelerating Oxygen Reduction Catalysts through Preventing Poisoning with Non-Reactive Species by Using Hydrophobic Ionic Liquids". *Angew. Chem. Int. Ed.* **55**, 2257-2261 (2015).
- [34] J. Gläsel, J. Diao, Z. Feng, M. Hilgart, T. Wolker, D.S. Su and B.J.M. Etzold "Mesoporous and Graphitic Carbide-Derived Carbons as Selective and Stable Catalysts for the Dehydrogenation Reaction". *Chem. Mater.* **27**, 5719 (2015).
- [33] T. Ariyanto, B. Dyatkin, G.-Z. Zhang, A. Kern, Y. Gogotsi and B.J.M. Etzold "Synthesis of Carbon Core-Shell Pore Structures and their Performance as Supercapacitors". *Microporous and Mesoporous Mater.* **218**, 130-136 (2015).
- [32] G.-R. Zhang, M. Munoz, B.J.M. Etzold, "Boosting Performance of Low Temperature Fuel Cell Catalysts by Subtle Ionic Liquid Modification". *ACS Appl. Mater. Interfaces* **18**, 3562-3570 (2015).
- [31] B. Hasse, J. Gläsel, A.M. Kern, D.Yu. Murzin and B.J.M. Etzold, "Preparation of carbide-derived carbon supported platinum catalysts". *Catal. Today* **249**, 30-37 (2015).
- [30] S. Gütlein, C. Burkard, J. Zeilinger, M. Niedermaier, M. Klumpp, V. Kolb, A. Jess and B.J.M. Etzold "A feasible way to remove the heat during adsorptive methane storage". *Environ. Sci. Technol.* **49**, 672-678 (2015).
- [29] B.J.M. Etzold, I. Neitzel, M. Kett, F. Strobl, V.N. Mochalin and Y. Gogotsi, "Layer-by-Layer Oxidation for Decreasing the Size of Detonation Nanodiamond". *Chem. Mater.* **26**, 3479-3484 (2014).
- [28] A.M. Cubillas, M. Schmidt, T.G. Euser, N. Taccardi, S. Unterkofler, P. St.J Russell, P. Wasserscheid, and B.J.M. Etzold, "In-situ Heterogeneous Catalysis Monitoring in a Hollow-Core Photonic Crystal Fiber Microflow Reactor". *Adv. Mat. Interfaces* 1300093 (2014).
- [27] T. Knorr, A. Schwarz, and B.J.M. Etzold, "Comparing different synthesis procedures for carbide-derived carbon based structured catalyst supports". *Chem. Eng. Technol.* **37**, 453-461 (2014).
- [26] A.V. Kirilin, B. Hasse, A.V. Tokarev, L.M. Kustov, G.N. Baeva, G.O. Bragina, A.Y. Stakheev, A.R. Rautio, T. Salmi, B.J.M. Etzold, J.P. Mikkola, and D.Y. Murzin, "Aqueous-phase

reforming of xylitol over Pt/C and Pt/TiC-CDC catalysts: catalyst characterization and catalytic performance". *Cat. Sci. Technol.* **4**, 387-401 (2014).

- [25] T. Fey, B. Zierath, A. Kern, P. Greil, and B.J.M. Etzold, "An advanced method to manufacture hierarchically structured carbide-derived carbon monoliths". *Carbon* **70**, 30-37 (2014).
- [24] A. Silvestre-Albero, S. Rico-Frances, F. Rodriguez-Reinoso, A.M. Kern, M. Klumpp, B.J.M. Etzold, and J. Silvestre-Albero, "High selectivity of TiC-CDC for CO<sub>2</sub>/N<sub>2</sub> separation". *Carbon* **59**, 221-228 (2013).
- [23] M. Schmidt, A.M. Cubillas, N. Taccardi, T.G. Euser, T. Cremer, F. Maier, H.-P. Steinrück, P. St.J. Russell, P. Wasserscheid, and B.J.M. Etzold, "Chemical and (Photo)-Catalytical Transformations in Photonic Crystal Fibers". *ChemCatChem* **5**, 641-650 (2013).
- [22] A.M. Cubillas, S. Unterkofler, T.G. Euser, B.J.M. Etzold, A.C. Jones, P.J. Sadler, P. Wasserscheid, and P. St.J. Russell, "Photonic crystal fibres for chemical sensing and photochemistry". *Chem. Soc. Rev.* **42**, 8629-8648 (2013).
- [21] A. Schlange, A.R. dos Santos, B. Hasse, B.J.M. Etzold, U. Kunz, and T. Turek, "Titanium carbide-derived carbon as a novel support for platinum catalysts in direct methanol fuel cell application". *J. Power Sources* **199**, 22-28 (2012).
- [20] T. Knorr, F. Strobl, F. Glenk, and B.J.M. Etzold, "Recommendations for the Production of Silicon Carbide-derived Carbon Based on Intrinsic Kinetic Data". *Chem. Eng. Technol.* **35**, 1495-1503 (2012).
- [19] T. Knorr, M. Kaiser, F. Glenk, and B.J.M. Etzold, "Shrinking core like fluid solid reactions- A dispersion model accounting for fluid phase volume change and solid phase particle size distributions". *Chem. Eng. Sci.* **69**, 492-502 (2012).
- [18] T. Knorr, P. Heini, J. Schwerdtfeger, C. Körner, R.F. Singer, and B.J.M. Etzold, "Process specific catalyst supports - Selective electron beam melted cellular metal structures coated with microporous carbon". *Chem. Eng. J.* **181-182**, 725-733 (2012).
- [17] A.M. Cubillas, M. Schmidt, M. Scharrer, T.G. Euser, B.J.M. Etzold, N. Taccardi, P. Wasserscheid, and P. St.J. Russell, "Ultra-Low Concentration Monitoring of Catalytic Reactions in Photonic Crystal Fiber". *Chem. Eur. J.* **18**, 1586-1590 (2012).
- [16] M. Schmirler, T. Knorr, T. Fey, A. Lynen, P. Greil, and B.J.M. Etzold, "Fast production of monolithic carbide-derived carbons with secondary porosity produced by chlorination of carbides containing a free metal phase". *Carbon* **49**, 4359-4367 (2011).
- [15] M. Schmirler, F. Glenk, and B.J.M. Etzold, "In-situ thermal activation of carbide-derived carbon". *Carbon* **49**, 3679-3686 (2011).
- [14] V.N. Mochalin, I. Neitzel, B.J.M. Etzold, A. Peterson, G. Palmese, and Y. Gogotsi, "Covalent Incorporation of Aminated Nanodiamond into an Epoxy Polymer Network". *ACS Nano* **5**, 7494-7502 (2011).
- [13] F. Heym, B.J.M. Etzold, C. Kern, and A. Jess, "Analysis of evaporation and thermal decomposition of ionic liquids by thermogravimetric analysis at ambient pressure and high vacuum". *Green Chem.* **13**, 1453-1466 (2011).
- [12] F. Heym, J. Haber, W. Korth, B.J.M. Etzold, and A. Jess, "Vapor Pressure of Water in Mixtures with Hydrophilic Ionic Liquids - A Contribution to the Design of Processes for

Drying of Gases by Absorption in Ionic Liquids". *Chem. Eng. Technol.* **33**, 1625-1634 (2010).

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- [10] F. Glenk, M. Schirmer, S. Gütlein, and B. Etzold, "Synthese mikroporöser Kohlenstoffschäume für katalytische Anwendungen". *Chem. Ing. Tech.* **82**, 897-903 (2010).
- [9] F. Glenk, T. Knorr, M. Schirmer, S. Gütlein, and B. Etzold, "Synthesis of microporous carbon foams as catalyst supports". *Chem. Eng. Technol.* **33**, 698-703 (2010).
- [8] P. Becker, F. Glenk, M. Kormann, N. Popovska, and B.J.M. Etzold, "Chlorination of titanium carbide for the processing of nanoporous carbon: A kinetic study". *Chem. Eng. J.* **159**, 236-241 (2010).
- [7] B. Etzold, A. Jess, and M. Nobis, "Epimerisation of Menthol-Diastereomers: Kinetic Studies for the Heterogeneously Catalysed Menthol Production". *Catal. Today* **140**, 30-36 (2009).
- [6] E. Öchsner, B. Etzold, K. Junge, M. Beller, and P. Wasserscheid, "Kinetic study of the asymmetric hydrogenation of methyl acetoacetate in the presence of a ruthenium binaphthophosphine complex". *Adv. Synth. Catal.* **351**, 235-245 (2008).
- [5] B. Etzold, and A. Jess, "Epimerisation of Menthol Stereoisomers Part 2: Improvement by the use of a continuous presaturated one liquid flow reactor". *Chemistry Today* **26**, 13-18 (2008).
- [4] B. Etzold, and A. Jess, "Epimerisation of Menthol Stereoisomers Part 1: Studies on the Intrinsic Kinetics". *Chemistry Today* **26**, 21-24 (2008).
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- [2] U. Kernchen, B. Etzold, W. Korth, and A. Jess, "Solid catalyst with ionic liquid layer (SCILL) - a new concept to improve selectivity illustrated by hydrogenation of cyclooctadiene". *Chem. Eng. Technol.* **30**, 985-994 (2007).
- [1] U. Kernchen, B. Etzold, W. Korth, and A. Jess, "Verbesserung der Selektivität fester Katalysatoren durch die Beschichtung mit ionischen Flüssigkeiten - Untersuchungen am Beispiel der Hydrierung von Cyclooctadien". *Chem. Ing. Tech.* **79**, 807-819 (2007).

#### Book Chapters:

- [1] D.Y. Murzin, Y. Demidova, B. Hasse, B.J.M. Etzold, and I.L. Simakova, "Synthesis of fine chemicals using catalytic nanomaterials: structure sensitivity". in "Fuels and high added value chemical production using nanomaterials". A.M. Balu, and R. Luque, Ed., *Taylor and Francis Book*, Boca Raton (2014).

- [2] S. Oswald, and B.J.M. Etzold, "Oxidation and purification of carbon nanoparticles". in "Carbon Nanomaterials Handbook". V. Presser, and Y. Gogotsi, Ed., *CRC Press*, Boca Raton (2013).

### Front Covers:



Angew. Chem. Int. Ed. 55 (2015); Chem. Soc. Rev. 42 (2013); ChemCatChem 5 (2013); Chem. Eng. J. 181-182 (2012)

### Patents:

- [1] A. Jess, W. Korth and B. Etzold, "Porous Heterogeneous Catalyst Coated With An Ionic Fluid" patentee Süd-Chemie AG, EP 2024088 B1, 26.04.2006 (disclosure 18.02.2009).

### Most important invited presentations:

- B.J.M. Etzold "Chemical engineering in materials synthesis: New carbon materials for a renewable energy scenario" *5th Japanese-German Symposium on Carbon Materials* in Freiberg (2015). **plenary lecture**
- A.V. Kirilin, B. Hasse, A.V. Tokarev, L.M. Kustov, G.N. Baeva, G.O. Bragina, A.Y. Stakheev, A-R. Rautio, T. Salmi, B.J.M. Etzold, J-P. Mikkola and D.Y. Murzin, "Carbon supported catalysts for the aqueous phase reforming" *4th Japanese-German Symposium on Carbon Materials* in Hokkaido (2014).
- B. Hasse, J. Gläsel, F. Reißner, P. Hausmann, C. Dicenta and B.J.M. Etzold, "Catalytic Application of Nanoporous Carbon Materials" *6th Forum on New Materials* in Montecatini Terme (2014).
- B.J.M. Etzold, "Synthesis and application of advanced carbon materials based on carbide-derived carbons (CDC)" *National Conference on Carbon Materials* in Mumbai (2012). **plenary lecture**
- B.J.M. Etzold, "Advanced carbon materials based on carbide-derived carbons (CDC)" *International Conference on Emerging Advanced Nanomaterials* in Brisbane (2012).

- B.J.M. Etzold "The carbide-derived carbon method: Possibilities toward hierarchically structured carbons via manipulating carbides and carbons" *2nd Japanese-German Symposium on Carbon Materials* in Tokio (2010).
- F. Glenk, S. Gütlein and B.J.M. Etzold "Synthesis and utilization of microporous carbons deposited on macroporous substrates" *3<sup>rd</sup> ChinaNANO* in Beijing (2009). **key note**