Publikationsliste

Journal Publikationen

[1] **M. Börnhorst**, P. Walzel, A. Rahimi, A. Kharaghani, E. Tsotsas, N. Nestle, A. Besser, F. Kleine Jäger, T. Metzger: Influence of Pore Structure and Impregnation-drying Conditions on the Solid Distribution in Porous Support Materials, Drying Technology Journal, 34(16), 1964-1978, 2015, DOI: 10.1080/07373937.2016.1147048.

[2] **M. Börnhorst**, O. Deutschmann: Single droplet impingement of urea water solution on a heated substrate, International Journal of Heat and Fluid Flow, 69, 55-61, 2018, DOI: 10.1016/j.ijh eatfluidflow.2017.1007.

[3] **M. Börnhorst**, S. Langheck, H. Weickenmeier, C. Dem, R. Suntz, O. Deutschmann: Characterization of solid deposits from urea water solution injected into a hot gas test rig, Chemical Engineering Journal, 377, 119855, 2019, DOI: 10.1016/j.cej.2018916.

[4] **M. Börnhorst**, X. Cai, M. Wörner, O. Deutschmann: Maximum Spreading of Urea Water Solution during Drop Impingement, Chemical Engineering & Technology, 42(11), 2419-2427, 2019, DOI: 10.1002/ceat.201800755.

[5] S. Tischer, **M. Börnhorst**, J. Amsler, G. Schoch, O. Deutschmann: Thermodynamics and reaction mechanism of urea decomposition, Physical Chemistry Chemical Physics, 21, 16785-16797, 2019, DOI: 10.1039/c9cp01529a.

[6] D. Schweigert, B. Damson, H. Lüders, **M. Börnhorst**, O. Deutschmann: Heat transfer during spray/wall interaction with urea water solution: an experimental parameter study, International Journal of Heat and Fluid Flow, 78, 108432, 2019, DOI: 10.1016/j.ijheatfluidflow.2019.108432.

[7] **M. Börnhorst**, C. Kuntz, S. Tischer, O. Deutschmann: Urea derived deposits in diesel exhaust gas after-treatment: Integration of urea decomposition kinetics into a CFD simulation, Chemical Engineering Science, 211, 115319, 2020, DOI: 10.1016/j.ces.2019.115319.

[8] J. Dörnhöfer, **M. Börnhorst**, C. Ates, N. Samkhaniani, J. Pfeil, M. Wörner, R. Koch, H.-J. Bauer, O. Deutschmann, B. Frohnapfel, T. Koch: A Holistic View on Urea Injection for NO_x Emission Control: Impingement, Re-atomization and Deposit Formation, Emission Control Science and Technology, 6(2), 228-243, 2020, DOI: 10.1007/s40825-019-00151-0.

[9] U. Budziankou, **M. Börnhorst**, C. Kuntz, O. Deutschmann, T. Lauer: Deposit formation from urea injection: A comprehensive modelling approach, Emission Control Science and Technology, 6(2), 211-227, 2020, DOI: 10.1007/s40825-020-00159-x.

[10] C. Ates, **M. Börnhorst**, R. Koch, M. Eck, O. Deutschmann, H.-J. Bauer: Morphological characterization of urea derived deposits in SCR systems, Chemical Engineering Journal, 409, 128230, 2021, DOI: 10.1016/j.cej.2020.128230.

[11] **M. Börnhorst**, J. Friedland, B. Kreitz, E. Moioli, G. Wehinger: NaWuReT-Workshop: Forschung in der Reaktionstechnik für und mit der Gesellschaft?, Chemie Ingenieur Technik, 93(8), 1210-1213, 2021, DOI: 10.1002/cite.202100017.

[12] C. Kuntz, C. Kuhn, H. Weickenmeier, S. Tischer, **M. Börnhorst**, O. Deutschmann: Kinetic modeling and simulation of high-temperature by-product formation from urea decomposition, Chemical Engineering Science, 246, 116876, 2021, DOI: 10.1016/j.ces.2021.116876.

[13] **M. Börnhorst**, O. Deutschmann: Advances and challenges of ammonia delivery by urea-water sprays in SCR systems, Progress in Energy and Combustion Science, 87, 100949, 2021, DOI: 10.1016/j.pecs.2021.100949.

[14] C. Kuhn, D. Schweigert, C. Kuntz, **M. Börnhorst**: Single droplet impingement of urea water solution on heated porous surfaces, International Journal of Heat and Mass Transfer, 181, 121836, 2021, DOI: 10.1016/j.ijheatmasstransfer.2021.121836.

[15] M. Stein, V. Bykov, C. Kuntz, **M. Börnhorst**, O. Deutschmann, U. Maas: Modeling the decomposition of urea-water-solution in films and droplets under SCR conditions with chemistry in the liquid phase, International Journal of Heat and Fluid Flow, 94, 108936, 2022, DOI: 10.1016/j.ijheatfluidflow.2022.108936.

[16] W. Shou, P. Rohlfs, **M. Börnhorst**, A. Schillaci, H. Marschall, O. Deutschmann, M. Wörner: Bubble cutting by cylinder - elimination of wettability effects by separating liquid film, Chemie Ingenieur Technik, 94(3), 1-9, 2022, DOI: 10.1002/cite.202100145.

[17] C. Kuntz, H. Weickenmeier, **M. Börnhorst**, O. Deutschmann: Deposition and decomposition of urea and its by-products on TiO2 and VWT-SCR catalysts, International Journal of Heat and Fluid Flow, 95, 108969, 2022, DOI: 10.1016/j.ijheatfluidflow.2022.108969.

[18] M. Eck, P. Lott, D. Schweigert, **M. Börnhorst**, O. Deutschmann: Spatially Resolved Measurements of HNCO Hydrolysis over SCR Catalysts, Chemie Ingenieur Technik, 94(5), 738-746, 2022, DOI: 10.1002/cite.202100192.

[19] A. Düll, P. Rohlfs, O. Deutschmann, **M. Börnhorst**: Performance Evaluation of KBH4 as Energy Carrier for Shipping Applications, Chemie Ingenieur Technik, 94(5), 747-759, 2022, DOI: 1 0.1002/cite.202100193.

[20] B. Kreitz, P. Biessey, **M. Börnhorst**, V. Schallhart, T. Westermann: Trendbericht Technische Chemie, Nachrichten aus der Chemie, 70, 56-64, 2022, DOI: 10.1002/nadc.20224124649.

[21] J. Friedland, **M. Börnhorst**, B. Kreitz, E. Moioli, G. Wehinger: NaWuReT Colloquium: From PhD Student to Assistant Professor – Early Career Chemical Engineers in Academia, Chemie Ingenieur Technik, 94(5), 629-633, 2022, DOI: 10.1002/cite.202100200.

[22] C. Kuhn, A. Düll, P. Rohlfs, S. Tischer, **M. Börnhorst**, O. Deutschmann: Iron as recyclable energy carrier: Feasibility study and kinetic analysis of iron oxide reduction, Applications in Energy and Combustion Science, 12, 100096, 2022, DOI: 10.1016/j.jaecs.2022.100096.

[23] O. Schumacher, C. Ates, **M. Börnhorst**, R. Koch, P. Stephan: Deposit formation from evaporating urea-water droplets on substrates of different wettability, Journal of Colloid and Interface Science, 634, 1-13, 2023, DOI: 10.1016/j.jcis.2022.1221.

[24] P. Naliwajko, J. Friedland, **M. Börnhorst**: NaWuReT and YounGeCatS Joint Summer School – Shaping a Green Future by Reaction Engineering and Catalysis, ChemCatChem, e202201548, 2023, DOI: 10.1002/cctc.202201548.

Vorträge

1. **M. Börnhorst**, P. Walzel, F. Kleine Jäger, T. Metzger: Feststoffbildung bei der Trocknung einer Lösung in Mikromodellen, Jahrestreffen der ProcessNet-Fachgruppen Trocknungstechnik und Mechanische Flüssigkeitsabtrennung, Karlsruhe, Deutschland, 2015.

2. **M. Börnhorst**, P. Walzel, A. Rahimi, A. Kharaghani, E. Tsotsas, N. Nestle, A. Besser, F. Kleine Jäger, T. Metzger: Einfluss von Porenstruktur und Trocknungsbedingungen bei der Imprägnierung poröser Trägermaterialien, Jahrestreffen der ProcessNet-Fachgruppe Trocknungstechnik, Weimar, Deutschland, 2016.

3. **M. Börnhorst**, O. Deutschmann: Spray/wall-interaction and deposit formation in ammonia selective catalytic reduction systems, International Workshop on Near Wall Reactive Flows, Darmstadt, Deutschland, 2017.

4. **M. Börnhorst**, O. Deutschmann: Droplet/wall-interaction of aqueous urea solution on heated targets, Jahrestreffen der ProcessNet-Fachgruppe Mehrphasenströmungen und CFD, Bremen, Deutschland, 2018.

5. **M. Börnhorst**, C. Kuntz, S. Tischer, O. Deutschmann: Ammonia Preparation in the Tailpipe: Spray/Wall Interaction and Deposit Formation, Cross-Cut Lean Exhaust Emissions Reduction Simulations (CLEERS), Ann Arbor, USA, 2018.

6. **M. Börnhorst**, U. Würth, O. Deutschmann: Spray/Wand-Interaktion im Abgasstrang von Diesel-Fahrzeugen: Temperatur- und Wärmetransporteffekte, InfraTec Thermografie-Anwenderkonferenz Forschung & Entwicklung, Stuttgart, Deutschland, 2018.

7. S. Wang, P. Rohlfs, **M. Börnhorst**, A. Schillaci, H. Marschall, O. Deutschmann, M. Wörner: Validation of a Phase-Field Method for Cutting of a Rising Bubble by a Horizontal Cylinder, Jahrestreffen der ProcessNet-Fachgruppe CFD, Frankfurt, Deutschland, 2019.

8. C. Kuntz, S. Tischer, **M. Börnhorst**, O. Deutschmann: Modeling urea deposit formation and decomposition on SCR catalysts, ECCOMAS Conference, European Community on Computational Methods in Applied Sciences, Web-Event, 2021.

9. **M. Börnhorst**, M. Eck, D. Schweigert, O. Deutschmann: Spatially resolved measurement of simultaneous isocyanic acid hydrolysis and NOx reduction on SCR catalysts, Jahrestreffen der ProcessNet-Fachgruppe Reaktionstechnik, Web-Event, 2021.

10. **M. Börnhorst**, T. Homan, N. G. Deen, M. Wörner: Charakterisierung der Zerteilungsdynamik von Blasen an Zylindern, Jahrestreffen der ProcessNet-Fachgruppe Mehrphasenströmungen, Web-Event, 2022.

11. C. Kuhn, P. Rohlfs, A. Düll, S. Tischer, **M. Börnhorst**, O. Deutschmann: Iron as recyclable metal fuel: Reaction kinetic analysis of iron oxide reduction with hydrogen, Jahrestreffen der ProcessNet-Fachgruppe Reaktionstechnik, Würzburg, Deutschland, 2022.

Poster (Auswahl)

1. **M. Börnhorst**, A. Bertótiné Abai, G. Schoch, O. Deutschmann: Analysis and Modeling of Deposit Formation and Decomposition in Urea-SCR Systems, Jahrestreffen der ProcessNet Fachgruppe „Reaktionstechnik“, Würzburg, Deutschland, 2016.

2. **M. Börnhorst**, C. Dem, O. Deutschmann: Experimental Studies on Deposit Formation in Urea-SCR Systems, International Combustion Institute Summer School on Near-Wall Reactive Flows, Bensheim, Deutschland, 2016.

3. **M. Börnhorst**, T. Häber, R. Suntz, O. Deutschmann: Spray/wall interaction and heat transfer in urea SCR systems, International Symposium on Modeling of Exhaust-Gas After-Treatment (MODEGAT), Bad Herrenalb, Deutschland, 2017.

4. A. Bertótiné Abai, **M. Börnhorst**, S. Tischer, O. Deutschmann: Modeling of Interface-Reactions in Urea-SCR System, International Symposium on Modeling of Exhaust-Gas After-Treatment (MODEGAT), Bad Herrenalb, Deutschland, 2017.

5. **M. Börnhorst**, T. Häber, R. Suntz, O. Deutschmann: Spray/Wand-Interaktion und Wärmeübergang in Harnstoff-SCR Systemen, Jahrestreffen der ProcessNet Fachgruppe „Wärme- und Stofftransport“, Bruchsal, Deutschland, 2017.

6. **M. Börnhorst**, A. Bertótiné Abai, S. Tischer, O. Deutschmann: Kinetic Analysis and Modeling of Evaporation and Urea Decomposition Processes in Exhaust Gas Aftertreatment Systems, International Symposium on Chemical Reaction Engineering, Florenz, Italien, 2018.

7. **M. Börnhorst**, C. Kuntz, S. Tischer, O. Deutschmann: Kinetic Analysis and Modeling of Urea Decomposition in Exhaust Gas Aftertreatment Systems, 11th International Congress on Catalysis and Automotive Pollution Control (CAPoC), Brüssel, Belgien, 2018.

8. **M. Börnhorst**, T. Homan, P. Rohlfs, N. Deen, O. Deutschmann, M. Wörner: Cutting of rising bubbles by a wire without contact, Jahrestreffen der ProcessNet Fachgruppen „Reaktionstechnik“ und „Mehrphasenströmung“, Würzburg, Deutschland, 2019.

9. **M. Börnhorst**, J. Dörnhöfer, C. Ates, N. Samkhaniani, J. Pfeil, M. Wörner, R. Koch, H.-J. Bauer, O. Deutschmann, B. Frohnapfel, T. Koch: A Holistic View on Urea Injection for NO_x Emission Control: Impingement, Re-atomization and Deposit Formation, International Symposium on Modeling of Exhaust-Gas After-Treatment (MODEGAT), Bad Herrenalb, Deutschland, 2019.

10. U. Budziankou, **M. Börnhorst**, C. Kuntz, O. Deutschmann, T. Lauer: Deposit formation from urea injection: A comprehensive modelling approach, International Symposium on Modeling of Exhaust-Gas After-Treatment (MODEGAT), Bad Herrenalb, Deutschland, 2019.

11. C. Kuhn, D. Schweigert, **M. Börnhorst**, O. Deutschmann: Single droplet impingement of urea water solution on heated porous surfaces, Jahrestreffen der ProcessNet Fachgruppen „Mehrphasenströmung“ und „CFD“, Paderborn, Germany, 2021.

12. C. Kuhn, D. Schweigert, **M. Börnhorst**, O. Deutschmann: Single droplet impingement of urea water solution on heated porous and coated surfaces, Droplets, Web-Event, 2021.

13. C. Kuntz, S. Tischer, **M. Börnhorst**, O. Deutschmann: Modeling urea deposit formation and decomposition on SCR catalysts, 743. WE-Heraeus-Seminar Process Integration, Chemical and Thermal Energy Storage for the Energy Transformation, Web-Event, 2021.

14. C. Kuhn, **M. Börnhorst**, O. Deutschmann: Kinetic study of the oxidation and thermochemical reduction of iron and iron oxides, 743. WE-Heraeus-Seminar Process Integration, Chemical and Thermal Energy Storage for the Energy Transformation, Web-Event, 2021.

15. A. Düll, S. Rudolph, M. Hettel, **M. Börnhorst**: Influence of chemical reactions on the convective dissolution of CO2 in a Hele-Shaw cell, Jahrestreffen der ProcessNet-Fachgruppe Reaktionstechnik, Würzburg, Deutschland, 2022.

16. **M. Börnhorst**, T. Homan, P. Rohlfs, N. Deen, M. Wörner: Dynamics of bubble cutting by interaction with a solid cylinder, 4th International Symposium on Multiscale Multiphase Process Engineering, Berlin, Deutschland, 2022.