2nd ICEPE 2011

International Conference on Energy Process Engineering

PROGRAMME

June 20 – 22, 2011
Frankfurt am Main/Germany

Efficient Carbon Capture for Coal Power Plants

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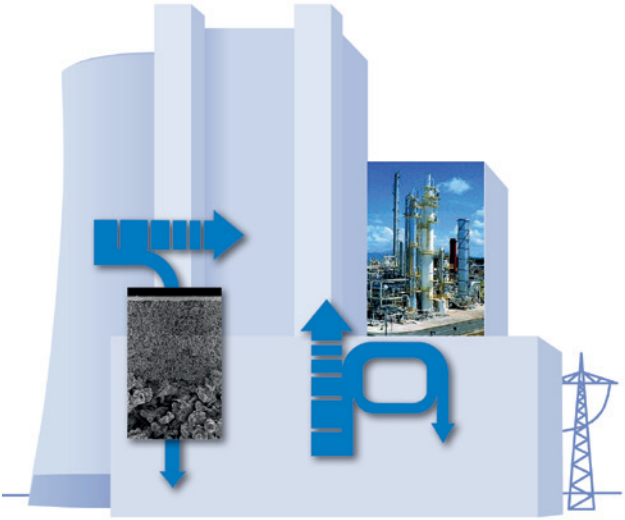

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MONDAY, JUNE 20, 2011

09:00	**Registration**
10:30	**Opening:** D. Stolten, Juelich Research Center, Germany
10:45	**Address from the IEA: CCS: Global Potential, Status & Challenges:** J. Lipponen, International Energy Agency, France
11:00	**Industry Perspectives on CCS:** H. Altmann, T. Porsche, Vattenfall Europe Generation AG, Germany
11:15	**Motivation for and Opportunities of CCS:** K. Lackner, Columbia University, USA
11:30	**Advanced Power Plant Technology:** H. Spliethoff, TU München, Germany
11:55	**Carbon Capture Options for Coal Power Plants:** D. Stolten, Juelich Research Center, Germany
12:20	**Physics and Chemistry of Absorption:** P. Feron, CSIRO, Australia
12:45	**Lunch**
	M1: Chemical Absorption Materials ***Session Chair:*** *K. Thomsen, TU Denmark, Denmark*
14:00	**Review Presentation on Chemical Absorption Materials** K. Thomsen, TU Denmark, Denmark
14:30	**New Absorbents for an Efficient CO_2-Separation – EffiCO_2 –** A. Schraven, Evonik Degussa GmbH, Germany; K. Görner, University Duisburg-Essen, Germany; S. Rinker, J. Rolker, P. Schwab, Evonik Degussa GmbH, Germany; P. Wasserscheid, Universität Erlangen-Nürnberg, Germany
14:55	**A Rational Approach to Amine Mixture Formulation for CO_2 Capture Applications** G. Puxty, CSIRO, Australia
15:20	**Carbon Capture with Low Environmental Impact: Siemens PostCap Technology** B. Fischer, D. Andrés-Kuettel, R. Joh, M. Kinzl, R. Schneider, H. Schramm, Siemens AG, Germany
15:45	**Development of Thermomorphic Biphasic Solvents for Low-Cost CO_2 Absorption Process** J. Zhang, D.W. Agar, TU Dortmund, Germany
16:10	**Coffee Break**
	Continuation of M1: Chemical Absorption Materials ***Session Chair:*** *K. Thomsen, TU Denmark, Denmark*
16:40	**The CO_2-Post-Combustion Capture Development Program at Niederaußem** P. Moser, S. Schmidt, RWE Power AG, Germany; G. Sieder, H. Garcia, BASF SE, Germany; T. Stoffregen, F. Rösler, Linde-KCA-Dresden GmbH, Germany
17:05	**Mass Transfer Coefficients – Experimental Evaluation of CO_2 Capture with Structure Packing** R.H. Chavez, Instituto Nacional de Investigaciones Nucleares, México; J. J. Guadarrama, Instituto Tecnologico de Toluca, México
17:30	**Pilot Plant Studies of New Solvents for Post-Combustion CO_2 Capture** I. Tönnies, H. P. Mangalapally, H. Hasse, TU Kaiserslautern, Germany
17:55 – 18:20	**Freezing Point Depression of Aqueous Solutions of DEEA, MAPA and DEEA-MAPA with and without CO_2 Loading** M. W. Arshad, TU Denmark

MONDAY, JUNE 20, 2011

12:45	**Lunch**
	P7: Chemical Looping in Power Plants ***Session Chair:*** *B. Epple, TU Darmstadt, Germany*
14:00	**Review Presentation on Chemical Looping in Power Plants** B. Epple, TU Darmstadt, Germany
14:30	**Carbon Stripping – A Critical Process Step in the Chemical Looping Combustion of Solid Fuels** M. Kramp, A. Thon, E.U. Hartge, S. Heinrich, J. Werther, TU Hamburg-Harburg, Germany
14:55	**Thermodynamic Analysis of a Base Case Coal-fired Chemical Looping Combustion Power Plant** V. Kempkes, A. Kather, TU Hamburg-Harburg, Germany
15:20	**High Temperature CO_2 Capture with CaO in a 200 kW_{th} Dual Fluidized Bed Pilot Facility** H. Dieter, C. Hawthorne, M. Zieba, G. Scheffknecht, University of Stuttgart, Germany
15:45	**CFD-model of a Fluidized Bed Chemical Looping System: Design of a Heat and Mass Flow Control** H. Kruggel-Emden; S. Wirtz; V. Scherer, Ruhr-Universität Bochum, Germany
16:10	**Coffee Break**
	EPL: Economics, Politics & Life Cycle Assessment ***Session Chair:*** *P. Viebahn,* *Wuppertal Institute for Climate, Environment and Energy, Germany*
16:40	**Review Presentation on Life Cycle Assessment for Power Plants with CCS** P. Viebahn, Wuppertal Institute for Climate, Environment and Energy, Germany
17:05	**Carbon Dioxide Capture from Power Generation: Status of Cost and Performance** M. Finkenrath, International Energy Agency, France
17:30	**Carbon Capture for Central Power Plants: From the viewpoint of an operated alliance** H.-J. Meier, VGB PowerTech e.V, Germany
17:55 – 18:20	**LCA of Coal-fired Oxyfuel Power Plants – Cryogenic versus Membrane-Based Air Separation** P. Zapp, Juelich Research Center, Germany

MONDAY, JUNE 20, 2011

12:45	**Lunch**
	P1: Oxyfuel Combustion with Cryogenic Air Separation ***Session Chair:*** *A. Kather, TU Hamburg-Harburg, Germany*
14:00	**Review Presentation on Oxyfuel Combustion with Cryogenic Air Separation** A. Kather, TU Hamburg-Harburg, Germany
14.30	**Dynamic Simulation of Oxyfuel Power Plants** A. Kroener, M. Pottmann, Linde AG, Germany
14.55	**CO_2-Capture from Cement Plants Applying Oxyfuel Concepts** S. Oberhauser, A. Kather, TU Hamburg-Harburg, Germany; S. Frie, Polysius AG, Germany
15:20	**High Pressure Oxyfuel Process with Staged Combustion** H. Tautz, Linde AG, Germany
15:45	**Vattenfalls CCS Strategy** U. Burchardt, Vattenfall Europe AG, Germany
16:10	**Coffee Break**
	Plant Engineering ***Session Chair:*** *F. Wohnsland, VDMA, Germany*
16:40	**Review Presentation on Codes and Standards for CCS** F. Wohnsland, VDMA, Germany
17:05	**Corrosion Aspects of Materials Selection for the CO_2 Transport and Storage** D. Bettge, Federal Institute for Materials Research and Testing, Germany
17:30	**Pipeline Design for CCS** U. Lubenau, DBI Gas- und Umwelttechnik GmbH, Germany
17:55 – 18:20	**Petreatment of Synthetic Sorbent for Sequentially CO_2 Capture** S. Stendardo, ENEA, C.R. Casaccia, Dep. of Advanced Technologies for Energy and Industry, Italy

18:30	Get-together, Poster Exhibition (Fingerfood & Beer)
20:00	End of First Conference Day

TUESDAY, JUNE 21, 2011

09:00	**Physics of Membrane Separation:** M. Wessling, RWTH Aachen, Germany
09:30	Change rooms
	P4: Post-Combustion Capture with Membranes ***Session Chair:*** *T. Melin, RWTH Aachen, Germany*
09:40	**Review Presentation on Post-Combustion Capture with Membranes** T. Melin, RWTH Aachen, Germany
10:10	**Coffee Break**
10.35	**Post- Combustion Processes Employing Polymeric Membranes** T. Brinkmann, T. Wolff, J.R. Pauls, Helmholtz-Zentrum Geesthacht, Germany
11:00	**Cascaded Membrane Processes for Post-Combustion CO_2 Capture** L. Zhao, E. Riensche, M. Weber, D. Stolten, Juelich Research Center, Germany
11:25	**Carbon Molecular Sieve Membranes for Carbon Capture** B.T. Low, T.-S. Chung, National University of Singapore, Singapore
11:50	**Lunch and Poster Exhibition**
	P2: Post-Combustion Capture with Chemical Absorption ***Session Chair:*** *H. Fahlenkamp, TU Dortmund, Germany*
13:50	**Review Presentation on Post-Combustion Capture with Chemical Absorption** H. Fahlenkamp, TU Dortmund, Germany
14:15	**Modeling and Scale-up Study of Post-Combustion CO_2 Absorption Using New Absorption Solvents** C. Kale, A. Górak, TU Dortmund, Germany; I. Tönnies, H. Hasse, TU Kaiserslautern, Germany
14:40	**Variants of Process Heat Extraction for Post-Combustion CO_2-Capture Plants in Exergetic Comparison** N. Pieper, M. Wechsung, Siemens AG, Germany
15:05	**Nonlinear Model Predictive Control for Operation of a Post-Combustion Absorption Unit** J. Åkesson, Modelon AB, Sweden, Lund University, Sweden; G. Lavedan, K. Prölß, H. Tummescheit, S. Velut Modelon AB, Sweden
15:30	**Coffee break**
	Continuation of P2: Post-Combustion Capture with Chemical Absorption ***Session Chair:*** *H. Fahlenkamp, TU Dortmund, Germany*
16:00	**Absorption and Desorption Modelling United** P. Fosbøl, K. Thomsen, TU Denmark, Denmark
16:25	**Development and Validation of a Process Simulator for Chilled Ammonia Process to Capture CO_2** R. Hiwale, J. Naumovitz, R. Agarwal, R. Kotdawala, Alstom Power Inc., USA
16:50	**Commercial Scale Test Validation of Modern High Performance Structured and Random Packings for CO_2-Capture Ranking** M. Schultes, Raschig GmbH, Germany
17:15	**Step Change Adsorbents and Processes for CO_2 Capture "STEPCAP"** A.I. Cooper, University of Liverpool, United Kingdom
17:40	End of Conference Day
19:30	**Conference Dinner with Reception and Poster Award** Dinner Speech: J. Heithoff, RWE Power AG, Germany

TUESDAY, JUNE 21, 2011

09:30	Change rooms
	M2: Physical Absorption Materials ***Session Chair:*** *M. Grünewald, Ruhr-Universität Bochum, Germany*
09:40	**Review Presentation on Physical Absorption Materials** M. Grünewald, Ruhr-Universität Bochum, Germany
10:10	**Coffee Break**
10.35	**Ionics Liquids for Carbon Dioxide Capture: Process Selection** J. Albo, J. Cristobal, A. Irabien, University of Cantabria, Spain
11:00	**Solubility of CO_2 in Functionalized Ionic Liquid** S. Paul, S. Shunmugavel, A. Riisager, R. Fehrmann, E.H. Stenby, K. Thomsen, TU Denmark, Denmark (t.b.c.)
11:25	**t.b.c.**
11:50	**Lunch and Poster Exhibition**
	M3: Inorganic Membranes ***Session Chair:*** *W. A. Meulenberg, Juelich Research Center, Germany*
13:50	**Review Presentation on Inorganic Membranes** W. A. Meulenberg, Juelich Research Center, Germany
14:15	**Progress, Performance and Pilot Testing of Post-Combustion CO_2 Capture Membranes at Six Industrial Test Sites** P.H. Raats, M. Huibers, L.A. Daal, KEMA, the Netherlands
14:40	**Advanced Membrane Design for Oxygen Separation** R. Kriegel, M. Schulz, K. Ritter, L. Kiesel, U. Pippardt, M. Stahn, I. Voigt, Fraunhofer Institute for Ceramic Technologies and Systems, Germany
15:05	**Testing of Nanostructured Gas Separation Membranes in the Flue Gas of a Post-Combustion Power Plant** M. Bram, K. Brands, W.A. Meulenberg, H.P. Buchkremer, D. Stöver, Juelich Research Center, Germany; G. Göttlicher, EnBW Energie, Germany; J. Pauls, Helmholtz-Zentrum Geesthacht, Germany
15:30	**Coffee break**
	M4: Polymer Membranes for Separation of CO_2 ***Session Chair:*** *V. Abetz, Helmholtz-Zentrum Geesthacht, Germany*
16:00	**Review Presentation on Polymer Membranes for Separation of CO_2 – An overview** V. Abetz, Helmholtz-Zentrum Geesthacht, Germany
16:25	**Ionic Liquid Coated Zeolite – PDMS Mixed Matrix Membrane for Gas Separation** M. Hussain, A. König, University Erlangen-Nürnberg, Germany
16:50	**t.b.c.**
17:15	**Functional Materials for CO_2 Separation from Natural and Biogas Streams** C. Staudt, Universität Düsseldorf, Germany

TUESDAY, JUNE 21, 2011

09:30	Change rooms
	P5: Oxyfuel Combustion with O_2-Transport Membranes ***Session Chair:*** *M. Modigell, RWTH Aachen, Germany*
09:40	**Review Presentation on Oxyfuel Combustion with O_2-Transport Membranes** M. Modigell, RWTH Aachen, Germany
10:10	**Coffee Break**
10.35	**Heat Exchanger Design for an Oxyfuel-Process Utilizing Oxygen from an O_2-Transport Membrane** V. Verbaere, R. Kneer, RWTH Aachen, Germany
11:00	**Oxygen Supply for Oxyfuel Power Plants by Oxy-Vac-Jül Process** J. Nazarko, E. Riensche, M. Weber, D. Stolten, Juelich Research Center, Germany
11:25	**Pilot Module for Oxygen Separation with BSCF Membranes.** A.Kaletsch, E.M. Pfaff, C. Broeckmann, N. Nauels, M. Modigell, RWTH Aachen, Germany
11:50	**Lunch and Poster Exhibition**
	P8: Terrestrial Storage ***Session Chair:*** *K. Lackner, Columbia University, USA*
13:50	**Review present Presentation on Onshore Storage** K. Lackner, Columbia University, USA
14:15	**Types and Structures of Onshore CO_2 Deposits** J.P. Gerling, Federal Institute for Geosciences and Natural Resources, Germany
14:40	**Storage of CO_2 in Saline Aquifers – The ASAP project** R. Luhning, Enbridge Ltd., Canada; J.A.M. Thomson, Norwest Corporation, USA; S. Broek, Hatch Ltd., Canada
15:05	**Coupled Processes during CO_2 Storage – Example of the Ketzin Pilot Site** S. Martens, F. Möller, A. Liebscher, S. Lüth, T. Kempka, M. Zimmer, A. Förster, M. Kühn, GFZ Potsdam, Germany
15:30	**Coffee break**
	GAS: CCS for Gas Power Plants ***Session Chair:*** *C. Bauer, PSI, Switzerland*
16:00	**Review Presentation on Results and Methodology of Dynamic Simulation on Hard Coal-, Lignite- and Natural Gas-fired Power Plants** C. Bauer, PSI, Switzerland
16:25	**Hybrid Absorber-Membrane CO_2 Capture** M. Huibers, P.H. Raats, N.A.M. ten Asbroek, KEMA, the Netherlands
16:50	**GT based Power Plants with CO_2 Capture Unit** G.-L. Agostinelli, Alstom Power, Switzerland
17:15	**t.b.c.**

WEDNESDAY, JUNE 22, 2011

	P3: Pre-Combustion Capture with Physical Absorption ***Session Chair:*** *R. van den Brink, Energy Research Centre of the Netherlands*
09:00	**Review Presentation on Pre- Combustion Capture with Physical Absorption** R. van den Brink, Energy Research Centre of the Netherlands
09:30	**Technology Development for IGCC with CCS** M.J. Prins, Shell Global Solutions International, the Netherlands
09:55	**An Improved SELEXOL™ Processing Scheme Reduces CO_2 Capture and Compression Costs** R. Matton, UOP NV – A Honeywell Company, Belgium; R. Palla, UOP LLC – A Honeywell Company, USA
10:20	**CO_2 Absorption Pilot Plant – Design, Commissioning, Operational Experience and Applications** A. von Garnier, A. Orth, Outotech GmbH, Energy; T. Stefan, Outotec GmbH, Ferrous Solutions, Germany; V. Giesen, R. Fernandez Rodiles, BASF SE, Germany

WEDNESDAY, JUNE 22, 2011

	P6: Pre-Combustion Capture with Membranes ***Session Chair:*** *V. Scherer, Ruhr-Universität Bochum, Germany*
09:00	**Review Presentation on Pre-Combustion Capture with Membranes** V. Scherer, Ruhr- Universität Bochum, Germany
09:30	**CO_2-Capture in Combined Solid Oxide Fuel Cell (SOFC)-Gasification-Cycles by Water Vapour Condensation** R. Leithner, C. Schlitzberger, TU Braunschweig, Germany
09:55	**ELCOGAS Pre-Combustion 14 MWt Carbon Capture Pilot Plant. Results & Conclusions after first Operations** P. Coca Llano, P. Casero, F. García Peña, ELCOGAS, Spain
10:20	**Process Development for Integrated Coal Gasification SOFC Hybrid Power Plants** M. Krüger, German Aerospace Center, Stuttgart, Germany; H. Müller-Steinhagen, TU Dresden, Germany

WEDNESDAY, JUNE 22, 2011

	M5: Chemical Looping Materials ***Session Chair:*** *A. Lyngfelt, Chalmers University Göteborg, Sweden*
09:00	**Review Presentation Chemical Looping Materials** A. Lyngfelt, Chalmers University Göteborg, Sweden
09:30	**Chemical Looping Combustion of Syngas in Packed Beds** H.P. Hamers, S. Smits, F. Gallucci, M. van SintAnnaland, TU Eindhoven, the Netherlands (t.b.c.)
09:55	**Investigations of the Reduction Behaviour of a Manganese Oxide Sinter Material as Oxygen Carrier Material for Chemical Looping Combustion** M. Buchmann, TU Bergakademie Freiberg, Germany; M. Wrobel, A. Saatci, Outotec GmbH, Germany
10:20	**Separation of CO_2 in Coal Fired Power Plants without Efficiency Losses?!** R. Leithner, M. Strelow, S. Magda, F. Röder, C. Schlitzberger, Technische Universität Braunschweig, Braunschweig/D

10:45	**Coffee Break**
11:15	**CO_2 Compression:** M. Gray, American Electric Power, USA
11:40	**Pipeline Transport:** C. Hendriks, ECOFYS, the Netherlands
12:05	**Conclusions and Closing:** V. Scherer, Ruhr-Universität Bochum, Germany
12:30	**Lunch**
13:30	**End of ICEPE 2011**

POSTER

Oxyfuel Combustion with Cryogenic Air Separation

P 01 **Numerical Simulation of Oxi-Fuel Combustion in a Cement Kiln**
D. A. Granados, J. M Mejía, F. Chejne, C.A. Gómez, Universidad Nacional de Colombia, Medellín/CO; A. Berrío, W.J. Jurado, Cementos Argos, Columbia

Post-Combustion Capture with Chemical Absorption

P 02 **Aspen Plus Simulation for CO_2-Flue Gas Separation of a Coal-Fired Power Plant**
U. Pahalagama Ranathunga Arachchige, M. Melaaen, Telemark University College, Norway

P 03 **Implications of the Part Load Behavior of an Integrated Post-Combustion CO_2 Capture Process for Hard-Coal-Fired Power Plants**
S. Linnenberg, A. Kather, TU Hamburg-Harburg, Germany

Inorganic Membranes

P 04 **CO_2-Stable and Co-Free Dual Phase Membrane for Oxygen Separation**
H.X. Luo, K. Effimov, H.Q. Jiang, A. Feldhoff, J. Caro, Leibniz University Hannover, Germany; H.H. Wang, South China University of Technology, China

P 05 **Investigation of Thermal and pO_2 Stability of $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$ for Oxygen-Transport Membranes**
C. Niedrig, S. Taufall, S.F. Wagner, W. Menesklou, E. Ivers-Tiffée, Karlsruhe Institute of Technology, Germany

P 06 **Separation of CO_2/N_2 by a Carbon Membrane**
Y. Wall, G. Braun, Cologne University of Applied Sciences, Germany; N. Kaltenborn, I. Voigt, Fraunhofer Institute for Ceramic Technologies and Systems, Germany; G. Brunner, TU Hamburg-Harburg, Germany

P 07 **Oxygen Permeation Performance of $La_{0.7}Sr_{0.3}Co_{0.5}Fe_{0.5}O_{3-\delta}$ Membrane in Different Atmospheres with Carbon Dioxide**
K. Jong Pyo, Chungnam National University, Republic of Korea; M. Edoardo, P. Jung Hoon, Korea Institute of Energy Research, Republic of Korea

P 08 **Hydrogen Separation and Stability of V-Y Alloy Membrane for Pre-Combustion Capture**
J. Sung Il, Chungnam National University, Republic of Korea; C. Soo Hyun, P. Jung Hoon, N. Sung Chan, Korea Institute of Energy Research, Republic of Korea

Organic Membranes

P 09 **A Zeolite (ZSM-5) PDMS (Polydimethylsiloxane) Mixed Matrix Membrane for CO_2 Separation**
M. Hussain, A. König, Universität Erlangen-Nürnberg, Germany

Pre-Combustion Capture with Physical Absorption

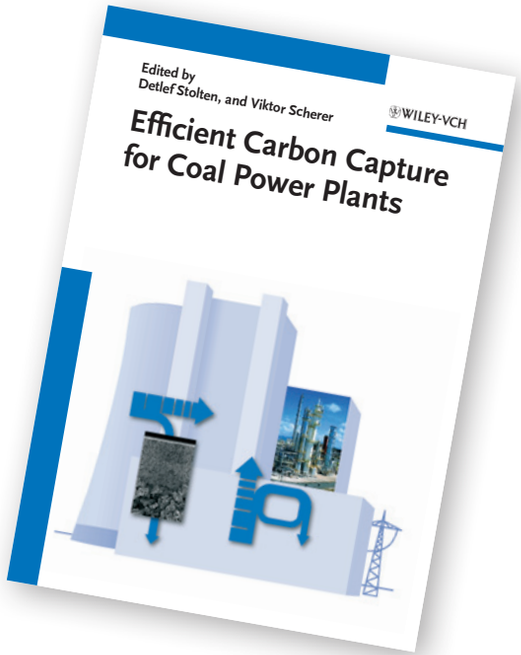
P 10 **Technical Evaluation of Post- and Pre-Combustion Carbon Dioxide Capture Methods Applied for an IGCC Plant for Power Generation**
A. Padurean, C.C. Cormos, P.S. Agachi, Babes Bolyai University, Romania

POSTER

Miscellaneous

P 11 **IOA, the CO_2- and Methane-Carbon Capturing Process: Effective and Secure Carbon Sequestration from Troposphere into Ocean Sediment by Flue Gas Conditioning of Coal Power Plants**
F. Oeste, gM-Ingenieurbüro, Germany; E. Ries, Ries Consulting GmbH u. Co. Betriebs KG, Germany

P 12 **Reducing CO_2-Capture Costs in Combined-Cycles by Replacing Excess Air by Water Injection into the Compressed Stoechiometric Air and Water Vapour Condensation**
R. Leithner, TU Braunschweig, Germany



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REGISTRATION FEE[1)]

Academia, Industry	620 €
Student, PhD-Student [2)]	300 €

1) No VAT requested acc. to § 4.22 UStG
2) Proof of status required

The conference ticket includes the Wiley-book of review and plenary contributions, the book of abstracts, the list of participants and beverages and meals during the breaks.

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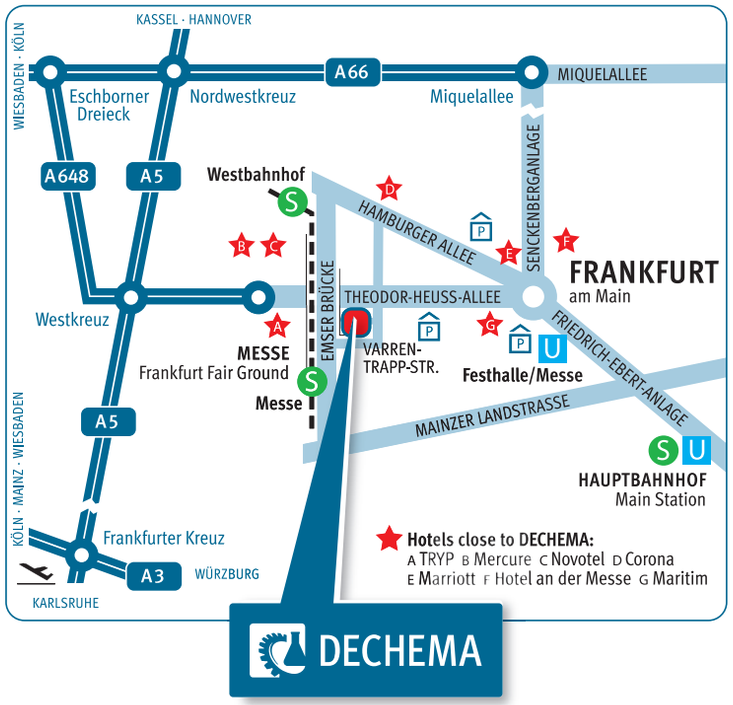
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