

General Information

Symposium Venue

The symposium will be held at Forschungszentrum Jülich, Auditorium (Building No. 04.7) from 15th to 16th June 2009.

Start of the Symposium

Monday, 15th June 2009, Registration 10:00 – 12:45,
Introduction (D. Stöver): 13:00

End of the Symposium

Tuesday, 16th June 2009, 17:00

Oral Presentations

The Auditorium is equipped with computer and video beamer.

Registration and Fee

The deadline for registration is 15th May 2009.

The fee include conference materials, coffee break catering,
conference dinner on 15th June, shuttle service to location/hotel.

Fees for

Participants:	EUR 120
for registration after 15 th May:	EUR 150
Students:	EUR 60
for registration after 15 th May:	EUR 90

Accommodation and Transfer

The allotment of rooms will be held for Membrane Symposium
Participants at the Hotel IBIS Normaluhr and Hotel Ibis
Marschierort in Aachen until 15th May 2009.

Please book your room directly with the hotels and mention the
reference „WSP10“. After 15th May 2009 reservations will be
accepted by the hotels on a space available basis.

Hotel IBIS Marschierort

Friedlandstraße 6-8, D-52064 Aachen, Germany
Tel.: +49-(0)241-478 80, Fax: +49-(0)241-478 81 10

Singleroom: 79,00 Euro per night incl. breakfast
Doubleroom: 89,00 Euro per night incl. breakfast

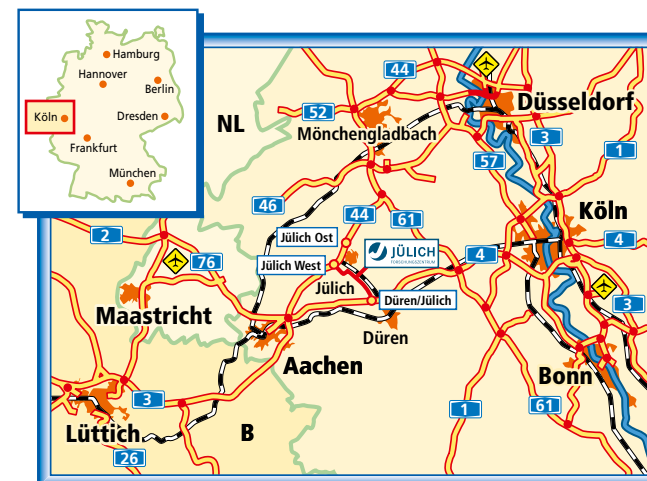
Hotel IBIS Normaluhr

Zollernstraße 2, D-52070 Aachen, Germany
Tel: +49-(0)241-51840, Fax: +49-(0)241-518 41 99

Singleroom: 73,00 Euro per night incl. breakfast
Doubleroom: 83,00 Euro per night incl. breakfast

**A shuttle service will be provided from Hotel IBIS
Marschierort Aachen to the conference venue.**

How to reach us:



Research Centre Jülich is situated southeast of Jülich
and is clearly signposted on all access roads.

http://www.fz-juelich.de/portal/about_us/reach_us

Further Information

Symposium Committee

Chairman: Prof. Dr. Detlev Stöver
Co-Chairman: Dr. Stefan Baumann,
Dr. Hans-Peter Buchkremer,
Dr. Wilhelm Meulenber,
Prof. Dr. Lorenz Singheiser, Dr. Robert Vaßen

Additional information is available at our website:

<http://www.fz-juelich.de/conference/wsp10>

or contact the conference service

Forschungszentrum Jülich GmbH
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10. Jülicher Werkstoffsymposium
Gas Separation Membranes for Zero-emission
Fossil Power Plants
15th – 16th June 2009

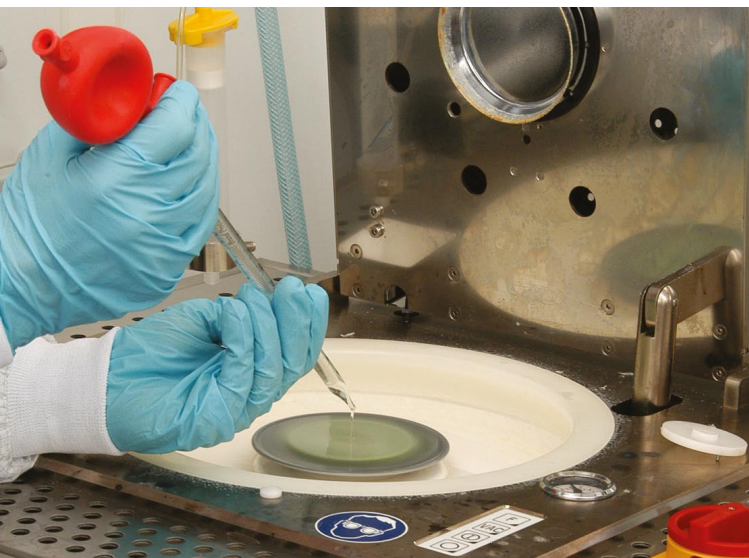
Invitation and Registration

Gas Separation Membranes for Zero-emission Fossil Power Plants

The reduction or avoidance of CO₂ emissions especially from fossil power plants is a major target in the present socio-economic, environmental and political situation. This mission could be achieved by introducing gas separation techniques using membranes. This technology would be associated with significantly lower efficiency losses compared with conventional separation technologies.

These membranes will enable the separation of the technically relevant gases, O₂/ N₂, H₂/CO₂ and CO₂/ N₂, in the various power plant concepts in order to achieve the purest possible exhaust gas stream of the greenhouse gas CO₂.

Although membranes are already used for substance separation in other fields (e.g. chemical industry), membranes for separating the technically relevant gases in fossil power plants are still far from being suitable for implementation in industrial applications. This symposium will outline the state-of-the-art of promising membrane materials, manufacturing routes, properties, characterisation and the possible implementation of membranes for gas separation in new fossil power plant concepts.



Programme

15th June 2009

Session 1: Demonstration projects for zero emission fossil power plants – *Chairman: L. Singheiser, Forschungszentrum Jülich GmbH (D)*

- 13:15 – 13:35 **Vattenfall oxyfuel power plant**
D. Kosel, M. Biele – Vattenfall Europe Generation AG & Co. KG (D)
- 13:35 – 13:55 **The OXYCOAL-AC project**
R. Kneer – RWTH Aachen University (D)
- 13:55 – 14:15 **The IGCC-CCS project at Hürth and the post-combustion pilot CO₂ scrubbing plant at Niederaußem**
S. Bohnes, J. Ewers – RWE Power AG (D)
- 14:15 – 14:35 **Geological storage of CO₂ in a deep saline aquifer at Ketzin, Germany**
M. Kühn, H. Würdemann, CO₂SINK Group – Deutsches GeoForschungsZentrum (D)

Session 2: Power plant concepts with integrated membranes for gas separation – *Chairman: H. Landes, Siemens AG (D)*

- 14:35 – 14:55 **Concepts and investment cost analyses of multi-stage membrane systems used in post-combustion processes**
L. Zhao – Forschungszentrum Jülich GmbH (D)
- 14:55 – 15:15 **Pre-combustion capture: General concept, evaluation of membranes**
V. Scherer, J. Franz – Ruhr University Bochum (D)
- 15:15 – 15:35 **Oxyfuel combustion by means of high temperature membranes**
M. Modigell – RWTH Aachen University (D)
- 15:35 – 15:55 **Questions and results of carbon capture recovery**
H. J. Wagner, S. Weber – Ruhr University Bochum (D); P. Zapp, A. Schreiber – Forschungszentrum Jülich GmbH (D)

Session 3: Polymer membranes and module concepts – *Chairman: K.V. Peinemann, GKSS – Forschungszentrum Geesthacht (D)*

- 16:30 – 16:50 **Design of CO₂-selective polymeric membrane**
W. Yave, A. Car, J. Wind, K. V. Peinemann – GKSS – Forschungszentrum Geesthacht (D)
- 16:50 – 17:10 **CO₂-capture in post combustion with facilitated transport membranes**
M.-B. Hägg – University of Trondheim (NO)

- 17:10 – 17:30 **CO₂-selective membranes – from laboratory development to industrial application**
T. Beeskow – GMT Membrantechnik GmbH (D)
- 17:30 – 17:50 **Design and construction of m² flat sheet membrane modules**
P. Raats, D. Sherban, F. Klug, P. van Dongen, C. Rutting – KEMA Nederland BV (NL)

16th June 2009

Session 4: Inorganic molecular sieving membranes – *Chairman: I. Voigt, Hermsdorf Institute of Technical Ceramics (D)*

- 08:30 – 08:50 **Advances in inorganic membranes for hydrogen production and purification**
M. Lu, J. D. da Costa, J. Beltrami, V. Rudolph – University of Queensland (AUS)
- 08:50 – 09:10 **Zeolite membranes for hydrogen separation under industrial conditions**
H. Richter, I. Voigt, M. Weyd, P. Puhfürß – Hermsdorf Institute of Technical Ceramics (D)
- 09:10 – 09:30 **Development of hydro-thermally stable membranes for application in power plants**
T. van Gestel, M. Bram, F. Hauler, W. A. Meulenbergh – Forschungszentrum Jülich GmbH (D)
- 09:30 – 09:50 **Gas separation using hybrid organic-inorganic microporous membranes**
H. J. M. Bouwmeester – University of Twente (NL)

Session 5: Inorganic oxygen transport membranes – *Chairman: M. Martin, RWTH Aachen University (D)*

- 10:30 – 10:50 **MIEC materials for oxygen separation – Transport properties and chemical stability**
M. Schroeder, S. Engels – RWTH Aachen University (D); T. Markus, S. Baumann – Forschungszentrum Jülich GmbH (D); R. Kriegel – Hermsdorf Institute of Technical Ceramics (D)
- 10:50 – 11:10 **Atomistic Modelling of MIEC membrane materials**
R. Dronskowski, M. Lumey – RWTH Aachen University (D)
- 11:10 – 11:30 **Processing and properties of asymmetric oxygen transport membranes**
S. Baumann, W. A. Meulenbergh – Forschungszentrum Jülich GmbH (D); R. Kriegel – Hermsdorf Institute of Technical Ceramics (D); E. Pfaff – RWTH Aachen University (D)

- 11:30 – 11:50 **Development of planar ceramic membranes for tonnage oxygen production in advanced energy applications**
M. F. Carolan, V. E. Stein, P. A. Armstrong – Air Products & Chemicals, Inc. (USA)

Session 6: Inorganic hydrogen transport membranes – *Chairman: W. A. Meulenbergh, Forschungszentrum Jülich GmbH (D)*

- 13:30 – 13:50 **High temperature ceramic membrane for hydrogen separation**
Y. Larring – SINTEF (NO); H. Haugrud – University of Oslo (NO)
- 13:50 – 14:10 **Manufacturing and stability issues of ceramic proton conducting membranes**
J. M. Serra, S. Escolástico – Consejo Superior de Investigaciones Científicas (E); M. Ivanova, W. A. Meulenbergh – Forschungszentrum Jülich GmbH (D)
- 14:10 – 14:30 **Manufacturing of hollow fibres for gas separation**
A. Buekenhoudt, F. Snijders, A. Kavaleuski, C. Buysse – Flemish Institute for Technological Research (B)
- 14:30 – 14:50 **Hydrogen separation palladium based alloy membranes: Recent developments and challenges**
M. den Exter, Y. van Delft, J. Vente – Energy Research Centre of the Netherlands (NL)

Session 7: High performance methods for membrane characterization – *Chairman: H.-D. Wiemhöfer, Universität Münster (D)*

- 15:00 – 15:20 **Characterization of oxidic membranes by high-resolution TEM**
S. Roitsch, J. Barthel und J. Mayer – Ernst Ruska-Centre (D)
- 15:20 – 15:40 **Characterization of ceramic membranes by the use of neutrons and X-rays**
G. Schumacher, T. Scherb – Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (D)
- 15:40 – 16:00 **Degradation study of mixed ionic electronic conducting materials**
A. Weber, C. Endler, E. Ivers-Tiffée – Universität Karlsruhe TH (D)
- 16:00 – 16:20 **Measurement of oxygen exchange kinetics and diffusion on oxygen membrane materials**
P. V. Hendriksen, M. Søgaard – RISØ DTU (DK)
- 16:20 – 16:40 **Thermomechanical behavior of MIEC gas separation membranes**
R. W. Steinbrech, B. Huang, L. Singheiser – Forschungszentrum Jülich GmbH (D)