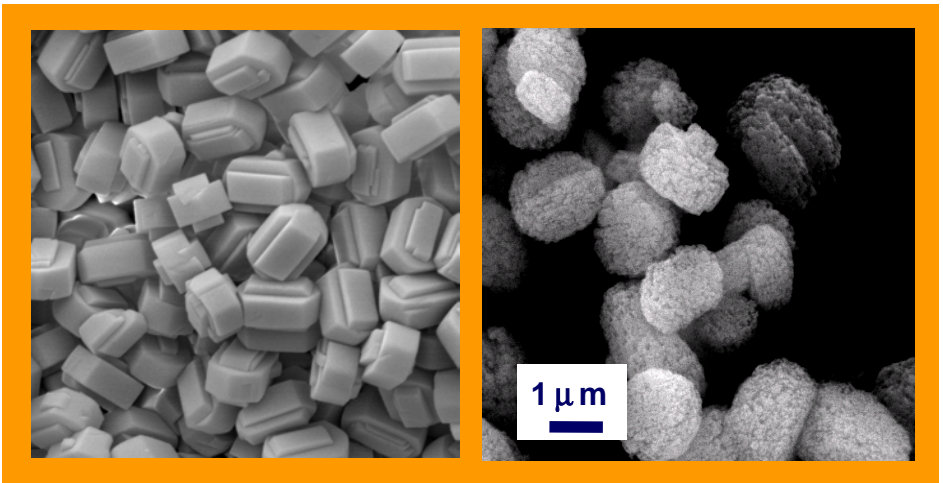


# *Zeolite-based Catalysis*

**TOPSØE CATALYSIS FORUM 2005**



**August 18-19<sup>th</sup>, 2005**

**Havreholm Castle  
Hornbæk, Denmark**

## Program

The Forum will be a two-day session where the first day is devoted to overview lectures that will form the basis for discussions that will take place after each lecture and also the following day, when three different groups will be formed to exchange views on specific themes.

### Wednesday, August 17<sup>th</sup>

Afternoon    Check-in Havreholm Castle for participants from abroad  
19.00           Buffet at Havreholm with participants from abroad

### Thursday, August 18<sup>th</sup>

07.30-09.00    Breakfast and arrival of local participants

**Morning Session: Chairman: Kim G. Knudsen, HTAS**

09.00-09.15    Jens Rostrup-Nielsen (Haldor Topsøe A/S)  
                  “*Welcoming introduction*”

09.15-10.00    Carlo Perego (EniTechnologie), “*Industrial applications of Zeolites*”

10.10-11.00    Michael Anderson (Univ. of Manchester), “*Synthesis and Structure of zeolites*”

Coffee break

11.15-12.00    Duncan Akporiaye (SINTEF), “*High-throughput experiments for synthesis and application of zeolites*”

Lunch

**Afternoon Session: Chairman: Bjerne S. Clausen, HTAS**

13.30-14.20    Raul Lobo (Univ. of Delaware), “*Design of zeolites*”

14.30-15.30    Silvia Bordiga (Univ. of Turin), “*Zeolite Characterization*”

Coffee break

16.00-16.50    Rutger van Santen (Eindhoven Univ. of Tech.), “*Reactivity of zeolites by DFT*”

19.00-           Dinner at Havreholm Castle

### Friday, August 19<sup>th</sup>

07.30-08.45    Breakfast

08.45-09.00    Poul Erik Højlund Nielsen (Haldor Topsøe A/S)  
                  “*Introduction to group discussions*”

09.00-12.30    Group Discussions

### **Group 1: Methanol to Hydrocarbons: Chairman Jesper Nerlov, HTAS**

- Unni Olsbye/Karl Petter Lillerud (Univ. of Oslo), “*Mechanisms for hydrocarbon formation in zeolites*”
- Eric G. Derouane (Univ. of Algarve), “*Methanol to olefins and fuels: present and future*”
- Claus H. Christensen (Tech. Univ. of Denmark) “*MTH – a sustainable approach*”

### **Group 2: Hydrocracking: Chairman Jens Anders Hansen, HTAS**

- Jens Anders Hansen (Haldor Topsøe A/S) “*Impact of zeolite properties on the performance of hydrocracking catalysts*”
- Duayne Whitehurst (formerly Mobil Oil Corporation), “*Structural considerations in the design of test reactions for zeolite catalyzed hydrocracking processes*”
- Nan Topsøe (Haldor Topsøe A/S), “*Fundamental understanding of zeolites for hydrocracking*”

### **Group 3: Alternatives to Conventional SCR DeNOx: Chairman Pär Gabrielsson, HTAS**

- Edward Jobson (Volvo), “*Directions of automotive pollution control*”
- Erik Fridell (Chalmers), “*Alternatives to the urea-SCR technology for NOx reduction*”
- Magnus Skoglund (Chalmers), “*Alternatives to vanadium catalysts, high throughput screening*”

Lunch

Closing Session: Chairman: Henrik Topsøe, HTAS

14.00-15.00 Closing Lecture: Jens Weitkamp (Univ. of Stuttgart)

## **Participants**

Besides the presenters, a few representatives from industrial collaboration partners may attend the meeting, but the majority of participants will be from Haldor Topsøe A/S. Up to 60 persons will attend the presentations on the first day and approximately 45 persons will take part in the discussions on day two. The meeting is held on a non-confidential basis.

### **Scientific Committee**

Jens Rostrup-Nielsen ([jrn@topsoe.dk](mailto:jrn@topsoe.dk))  
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Bjerne S. Clausen ([bsc@topsoe.dk](mailto:bsc@topsoe.dk))  
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Kim G. Knudsen ([kik@topsoe.dk](mailto:kik@topsoe.dk))

### **Programme Committee**

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Jesper Nerlov ([jen@topsoe.dk](mailto:jen@topsoe.dk))  
Susanne Mainz ([sum@topsoe.dk](mailto:sum@topsoe.dk))

## **Background**

The **TOPSØE CATALYSIS FORUM** has been created as a framework for an open exchange of views on catalysis in the fields of interest to Haldor Topsøe A/S. The idea is to discuss new reactions and new principles of catalysis in an attempt to jointly look beyond the horizon. In order to facilitate open discussions and to enable all participants to make use of the information received during the meetings in their future work, the meetings will be held on a non-confidential basis.

The **CATALYSIS FORUM** works through individual contacts and annual meetings focusing on a single topic.

### **“Zeolite-based Catalysis”**

The use of zeolites is becoming more and more important in catalysis and thus of increasing interest to Haldor Topsøe A/S. The topic of the second **TOPSØE CATALYSIS FORUM** is “Zeolite-based Catalysis” covering applications for conversion of methanol to hydrocarbons, hydrocracking and removal of NO<sub>x</sub>.

Large-scale production of methanol from stranded gas fields has given methanol renaissance as feedstock for production of hydrocarbons like olefins and gasoline. With the maturing of these technologies and the increasing oil prices catalytic improvements related to these technologies are expected to attract increased attention.

Zeolites have been used as a compound in hydrocracking catalysts for about 40 years. Other important refinery applications, where zeolites are used, are fluid catalytic cracking, isomerization, dewaxing and aromatics saturation. Hydrocracking is a very versatile process for clean fuel production. The continued need for improved fuel quality and conversion of an increasing amount of low-value feedstock into high-value products will call for new hydrocrackers and improved zeolite-based catalysts.

Conventional SCR DeNO<sub>x</sub> processes primarily use vanadium based catalysts. The use of vanadium based catalysts is under pressure due to environment issues. An interesting alternative might be to use zeolite-based catalysts for exhaust gas treatment. With respect to automobile exhaust applications, a major concern, however, is the durability of zeolite-based catalysts.

The aim of the seminar will be to shed light on and discuss the use of zeolites in catalysis. This should be done with a very open mind, since the idea is not just to review current knowledge, but also to provide a basis for radical innovations within the area in question.