



# Catalysis: An Integrated Approach

*A molecular approach  
to all aspects of catalysis*

## Catalysis...

Catalysis contributes 20-30% of the gross domestic products of industrialized countries. Catalysts play a vital role in the production of transportation fuels, bulk and fine chemicals in a sustainable way. Many more improvements are expected for the next years.

November 29 – December 4, 2009  
Schiermonnikoog, NL

Annual course organized by NIOK,  
Netherlands Institute for Catalysis Research

## ... a fascinating discipline

NIOK, the Dutch school of research in catalysis, with some 200 PhD students involved in research, offers the opportunity to gain a deeper insight into various aspects of this fascinating discipline: fundamental, theoretical, homogeneous, heterogeneous, industrial catalysis and biocatalysis. The main theme of this course is the molecular approach of catalysis in view of its applications, from catalyst preparation and characterization to reactor engineering.

## Target audience

The course is designed for graduates and polytechnic (HBO) levels, either as a first introduction or as a refresher course. Especially graduates preparing a doctoral dissertation related to catalysis are potential attendants, but also those who are already working in industry and feel the need to deepen their insights into catalytic processes.

## Subjects to be treated

### Introductory part

- history of catalysis: homogeneous, heterogeneous and biocatalysis
- chemical and technological aspects of a number of important industrial processes  
These processes will also form the framework for the subjects to be treated in the fundamental and applied parts of the course.
- chemical kinetics of catalyzed reactions

### Fundamental catalysis

- chemical bonding to surfaces, in metal complexes and in enzymes
- elementary reaction steps in catalysis
- kinetic and mechanistic processes of catalysis

### Applied catalysis

- catalytic reaction engineering
- preparation of catalyst supports including zeolites
- preparation of supported catalysts

### Catalyst characterization

- rapid screening techniques and backgrounds
- spectroscopic techniques
- temperature programmed techniques
- adsorption methods

### Modern developments seen from two angles:

- from the process technology side: more efficient and cleaner processes
- from the theoretical side: development of fundamental catalysis towards an independent science within chemistry and physics.

## Course teachers

Heterogeneous Catalysis  
Homogeneous Catalysis  
Reaction Engineering & Kinetics  
Biocatalysis  
Materials & Catalyst Preparation  
Characterization/Spectroscopy  
Industrial Catalysis  
Scientific Presenting

Prof.Dr.Ir. L. Lefferts, University of Twente  
Prof.Dr. D. Vogt, Eindhoven University of Technology  
Prof.Dr. F. Kapteijn, Delft University of Technology  
Dr. U. Hanefeld, Delft University of Technology  
Prof.Dr. K.P. de Jong, Utrecht University  
Prof.Dr. J.W. Niemantsverdriet, Eindhoven University of Technology  
Dr. M. Ruitenbeek, Dow Benelux BV  
Prof.Dr. J.W. Niemantsverdriet, Eindhoven University of Technology

### Place and time

The course is held on the island Schiermonnikoog. The lectures take place in "Het Dorpshuis", Torenstreek 18a. Lodging is in hotel "Van der Werff", Reeweg 2, Schiermonnikoog.

The course starts Sunday 29 November, 2009 (afternoon arrival) and ends Friday 4 December, 2009, after lunch.

### Textbook

The text book will be '*Catalysis, an integrated approach*', edited by Van Santen, Moulijn, Van Leeuwen and Averill, with contributions from many experts.

### Test

There will be a test early 2010, in Utrecht. The test is obligatory for NIOK graduates and taking it successfully is necessary for obtaining the Certificate of Proficiency. Consulting the text book during the test is permitted. ('open book test').

### Certificate

A *Certificate of Attendance* is available. A *Certificate of Proficiency* is available for those who successfully take the test. The Certificate of Proficiency entitles NIOK graduates to apply for a NIOK diploma accompanying their doctor's degree certificate.

### Registration

The registration form for the course can be downloaded from the NIOK website [www.niok.nl](http://www.niok.nl). The number of participants is limited to 50.

### Course fee

The course fee amounts

	Registration before Sept. 1 <sup>st</sup> 2009	Registration after Sept. 1 <sup>st</sup> 2009
Graduate students and postdocs working with NIOK members	€ 600	€ 700
All other graduate students and postdocs	€ 1000	€ 1100
All other participants*	€ 2800	€ 3000

\* VIRAN members have the right to send one employee of a member company's own staff at a reduced rate of € 600/700

The fee includes

- (full board) accommodation (29 November arrival, 4 December departure);
- a copy of the book '*Catalysis, an integrated approach*';
- other course materials and hand-outs.

### Cancellation fees

Cancellation fees are applicable:

- cancellation between 1 November – 20 November 2009: 50% of the course fee.
- cancellation after 20 November 2009: the full fee will be charged.

### Course leader

Prof.Dr. D. Vogt, Eindhoven University of Technology

### Contact

Arlette Werner (course coordination)  
Office of the Netherlands Institute for Catalysis Research (NIOK)  
Anna v. Saksenlaan 51  
P.O. Box 93223  
2509 AE The Hague, The Netherlands  
Tel +31 70 344 08 35  
Fax +31 70 344 07 87  
E-mail [courses \[@\] niok.nl](mailto:courses[@]niok.nl)



Hotel Van der Werff, Schiermonnikoog