

## Arvoisa Katalyysiseuran jäsen! Dear member of Catalysis Society!

The board of Catalysis Society has worked actively with our new event “The 1st Finnish Young Scientist Forum on Catalysis”. On the next page you’ll find an announcement of this seminar. The organizer of this annual Young Scientist Forum is circulating and Åbo Akademi has promised to take care of organizing the first event. The venue of the Forum is The Finnish Labour Museum Werstas in Tampere. The museum presents social history as well as the history of Finnish work and workers being definitely an interesting place to visit for all the participants. Our goal is to create a tradition, which gathers together researchers on catalysis to share their research and for networking. So be active and register to the event!

Board has also evaluated candidates for “The fourth Doctoral thesis award of the Finnish Catalysis Society”. The number of proposal was not very high, but the proposed theses were of very high quality. Selected theses have already been sent for an external evaluator. This person will choose the winner, which will be published during the Young Scientist Forum in Tampere. The winner will also give a keynote lecture at the event.

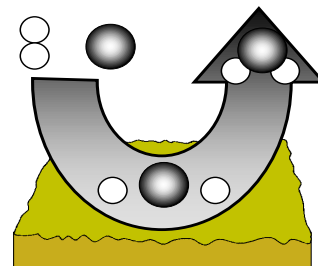
This year is again a year of Nordic Symposium on Catalysis to be organized this time in Lund, Sweden in June. You have still time to send an abstract to this conference since extended dead-line for the abstracts is 29<sup>th</sup> February. It is also notable that the winner of Berzelius Prize Karoliina Honkala from University of Jyväskylä will give an

invited lecture at the conference. Another significant conference in 2016 in the field of catalysis is The 16th International Congress on Catalysis in Beijing, China. Abstracts have already been submitted to this conference and currently we are waiting responses from the organizers.

The ultimate goal of our Society is to promote catalysis and catalysis research in Finland. This can be done e.g. by offering events strengthening networking and communication in this field and by supporting participation of young researchers in conferences. Our goal is also still to increase the number of members in our society. The 1st Finnish Young Scientist Forum on Catalysis will also be utilized as a venue to recruit new members to the society.

When I now look out through the window, Finnish winter weather does not show its best side. However, it is spring soon and hopefully I’ll meet as many of you as possible in Tampere!

Juha Lehtonen  
puheenjohtaja  
Chairman



## The 1<sup>st</sup> Finnish Young Scientist Forum on Catalysis on 8<sup>th</sup> of April, 2016, is coming!

A new tradition will start: Finnish Catalysis Society will organize the first Finnish Young Scientist Forum for Catalysis on **8<sup>th</sup> of April, 2016**, in the Finnish Labour Museum Werstas, Tampere, in connection with the annual meeting of the Finnish Catalysis Society.

The symposium has the goal to present on-going and recently finished PhD thesis works in catalysis and to promote the interaction between the key players in catalysis in our country. Contributions from all sub-fields of catalysis are very welcome: homogeneous, heterogeneous, enzymatic and polymer catalysis; presentations covering aspects from theoretical chemistry to material science and chemical engineering.

The symposium programme consists of a keynote lecture, a prize winner's lecture (the Prize for best doctoral thesis in catalysis for years 2013-2015 will be announced) and oral presentations of PhD students. After the symposium, the annual meeting of Finnish Catalysis Society will take place. All PhD students, their supervisors and other researchers in the field of catalysis in Finland are cordially welcome!

For more information, take a closer look on this Katse-newsletter or go to web page:

<http://web.abo.fi/fak/tkf/tek/youngscientist/>

## Registration

To register to the Young Scientist Forum, please go to web page:

<http://web.abo.fi/fak/tkf/tek/youngscientist/>

and fill in and save the information required.

If you are interested in giving a presentation, please provide the **title of your presentation and few highlights. No abstract is needed.** Please use the template in providing the title and the highlights. The template can be found on the web page of the Young scientist forum.

Please register to the event **latest on Monday, March 28, 2016.**

## Registration fee

The registration fee is **20 euro**. It should be paid directly to the account of Finnish Catalysis Society

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(Nordea Bank Account).

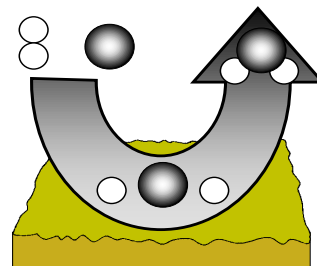
The fee covers the attendance to the lectures, the museum visit, the lunch, the afternoon coffee break, the cocktail party and the power-point presentations of the lectures.

## Venue

The young Scientist's forum will be organized in the **Finnish Labour Museum Werstas** which is located in the downtown of Tampere, in the historic Finlayson factory area. The museum specialises in social

# Katse

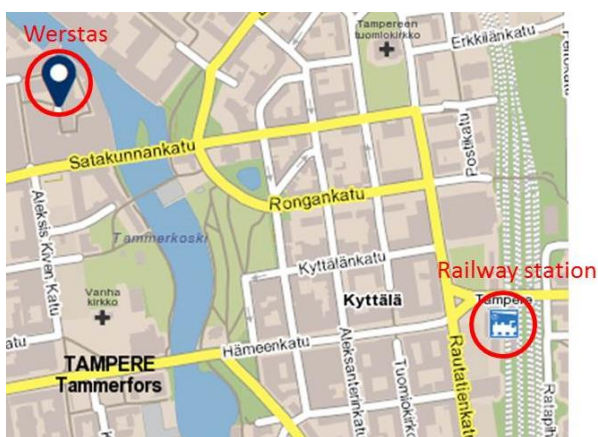
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history as well as recording, researching and exhibiting the history of work and workers.

Address: Väinö Linnan aukio 8,  
33210 Tampere  
Tel. +358 10 420 9220  
[info@tyovaenmuseo.fi](mailto:info@tyovaenmuseo.fi)



For more information on the venue, please visit:

<http://www.werstas.fi/?lang=en>

## Tentative programme

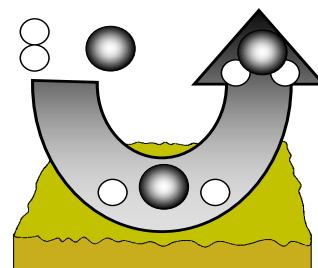
- 10.00 Welcoming address and Keynote lecture
- 10.30 Prize winner's lecture
- 11.00-12.00 Presentations of PhD thesis (à 15 min)
- 12.00-12.45 Lunch and networking
- 12.45-15.00 Presentations of PhD thesis (à 15 min)
- 15.00-15.15 Coffee break
- 15.15-17.00 Presentations of PhD thesis (à 15 min)
- 17.00-18.00 Museum visit/ Annual meeting of Finnish Catalysis Society
- 18.00-19.00 Cocktail Party

## Contact

If you have any questions regarding the 1<sup>st</sup> Young Scientist Forum, please contact:

Prof. Tapio Salmi, Åbo Akademi  
tsalmi@abo.fi

Prof. Juha Lehtonen, Aalto University  
juha.lehtonen@aalto.fi



## **Katalyysiseuran matka-apurahat 2016 / Travel grants of the Finnish Catalysis Society in 2016**

Vuonna 2016 Suomen Katalyysiseura jakaa matka-apurahoja nuorille tutkijoille, jotka pitävät esityksen **17<sup>th</sup> Nordic Symposium on Catalysis** –konferenssissa tai **16<sup>th</sup> International Congress on Catalysis (ICC 16)** –konferenssissa.

Vapaamuotoiset hakemukset toimitetaan seuran sihteerille (anna.valtanen@oulu.fi) 7.4.2016 mennessä. Apurahan saajille ilmoitetaan asiasta henkilökohtaisesti.

In 2016, the young scientists having a presentation in **17<sup>th</sup> Nordic Symposium on Catalysis** –conference or **16<sup>th</sup> International Congress on Catalysis (ICC 16)** –conference are invited to apply for travel grants.

The applications should be sent to the secretary of the Finnish Catalysis Society (anna.valtanen@oulu.fi) by 7<sup>th</sup> of April, 2016. Recipients of grants will be informed personally.

## **Katalyysiaiheisia väitöskirjoja talvi 2015-2016 / Catalysis related dissertations in winter 2015-2016**

**M.Sc. (Tech.) Inkeri Kauppi** from the Industrial Chemistry research group, Aalto University, defended her thesis on 15<sup>th</sup> of January, 2016. Her thesis is entitled “*The effect of H<sub>2</sub>S on oxidation properties of ZrO<sub>2</sub>-based biomass gasification gas clean-up catalysts*”.

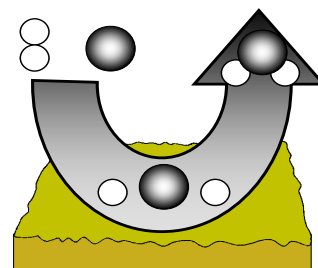
*Custodian:* Prof. Juha Lehtonen, Aalto University

*Opponent:* Prof. Lars J. Pettersson, KTH, Sweden

Biomass gasification gas contains impurities, which have to be removed before the gas can be utilized in e.g. energy or liquid fuels production. ZrO<sub>2</sub>-based catalysts can be used to oxidize tar impurities when oxygen is added to the gas. These catalysts have proven activity even when H<sub>2</sub>S is present. Moreover, an improving effect of H<sub>2</sub>S on ZrO<sub>2</sub> oxidation activity has been observed at temperatures of 600 and 700 °C. Therefore, the reactivities of unsulfided and sulfided ZrO<sub>2</sub>-based catalysts were studied in order to understand the enhancing effect of sulfur on oxidation activity during gasification gas clean-up.

Different adsorption modes of H<sub>2</sub>S on the ZrO<sub>2</sub>-based catalysts were established. Molecular adsorption occurred on all the studied catalysts at room temperature. The molecularly adsorbed H<sub>2</sub>S species are weakly bound and thus are not likely to be present on the surface at the high temperatures of gasification gas clean-up. Therefore, they cannot be the source of the enhanced reactivity, either. Dissociative adsorption of H<sub>2</sub>S was suggested on cation-anion pairs or by titration of terminal hydroxyl groups on ZrO<sub>2</sub> and doped ZrO<sub>2</sub>. However, the terminal SH groups formed in these surface processes cannot contribute to the observed oxidation activity improvement on ZrO<sub>2</sub>, as revealed by density functional theory (DFT) calculations.

Stable sulfur species formed on the surface of ZrO<sub>2</sub> during adsorption of H<sub>2</sub>S at elevated temperatures (at 100 °C and above). H<sub>2</sub>S reacts with the surface probably via replacement of surface lattice oxygen at



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specific defect sites. The amount of sulfur deposited on the surface in these high temperature processes was found to correlate with enhanced oxidation activity compared to unsulfided  $ZrO_2$ . This indicates that  $H_2S$  at elevated temperatures produces surface sulfur, which improves the redox properties of  $ZrO_2$ . Based on DFT calculations, sulfur species in the lattice (multicoordinated SH or S) at specific sites can cause enhanced reactivity of lattice oxygen, but so far the exact structure of this site remains unknown.

The interaction of  $H_2S$  with  $ZrO_2$  is limited to specific surface sites, comprising not more than approximately 11 % of the surface. Studies on toluene oxidation (a model compound for tar) also indicated that tar oxidation occurs on specific sites where the intermediate species form. Based on observations, it is proposed that the oxidation improvement by sulfur occurs on these specific sites where sulfur improves the reactivity of surface lattice oxygen. The sulfur tolerance of  $ZrO_2$  is thus originated by the limited number of sites capable of binding sulfur.

## Konferenssit ja symposium / Conferences and symposia

### The 4th Int'l Conference on Catalysis (ICC 2016)

June 1-3, 2016, Nanjing, China

<http://www.engii.org/ws2016/Home.aspx?id=744>

### 17<sup>th</sup> Nordic Symposium on Catalysis

June 14-16, 2016, Lund, Sweden

<http://nsc17.sljus.lu.se/>

### The 16th International Congress on Catalysis (ICC 16)

July 3-8, 2016, Beijing, China

<http://www.icc2016china.com/en/>

### 9th International Conference on Environmental Catalysis (ICEC)

July 10-13, 2016, Newcastle, Australia

<http://www.icec2016.org/>

Katso myös esim./See also e.g.

[www.conference-service.com](http://www.conference-service.com)

[www.iacs-icc.org/Events/events.html](http://www.iacs-icc.org/Events/events.html)

## Internet-osoitteita / Web pages

<http://www.katalyysiseura.org>

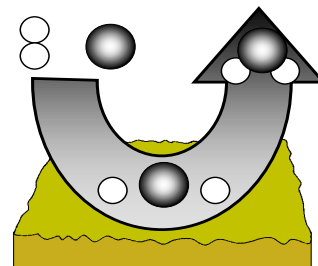
<http://www.kemianseura.fi>

<http://www.efcats.org>

<http://www.elsevier.com>

Katalyysiseuran hallitus toivoo, että saisimme jäsenkunnaltamme palautetta Katse-lehdestämme ja uutisia julkaistavaksi (esim. väitökset, kansalliset ja kansainväliset tapahtumat, palkinnot, kurssit yms.)! Palautteet ja uutiset voi toimittaa hallituksen jäsenille.

# Katse



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## Katalyysiseuran hallitus / Board of Finnish Catalysis Society

### ***Puheenjohtaja/Chair***

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