Katse

Suomen katalyysiseura
Finska katalyssällskapet
Finnish Catalysis Society

JÄSENKIRJE 1/2018

Arvoisa Suomen katalyysiseuran jäsen!

Dear member of the Finnish Catalysis Society!

Exceptionally warm early summer starts to be behind and based on recent weather forecasts, we are getting a normal Finnish summer weather for Midsummer i.e. rain and 10 - 15 °C. Anyway, the summer vacations of most of our catalysis society colleagues are soon starting and I think that we all deserve a relaxing holiday after though working year despite of the weather. I would like to wish you all pleasant summer holidays!

Young Scientist Forum

Young Scientist Forum was held third time in April and this time in Espoo. The Finnish Catalysis Society would like to thank prof. Riikka Puurunen and her team for organizing the event! Number of participants, nearly 60, indicates that our concept is good and attracts people year after year. This time especially the selection of plenary speaker was successful. Krijn de Jong gave scientifically interesting and excellent presentation. To my opinion, it is still important to give young researchers opportunity to present their research results, but a high level plenary speaker is also important for the event. However, we will also collect and will to improve the event based on feedback.

Nordic Symposium on Catalysis

18th Nordic Symposium on Catalysis will be held 26th -28th of August in Copenhagen. This is an excellent forum to meet and interact with nordic colleagues in the field of catalysis. I hope that Finland will have again a big delegation at the conference. It is also soon time to start to prepare next Nordic Symposium in 2020 in Finland. Finnish Catalysis Society has already selected the organizer of the 2020 event and this will be published in Copenhagen during the symposium.

Millenium Prize 2018

The laureate of Millenium Prize 2018 was Tuomo Suntola, developer of ALD (atomic layer deposition) technology. One potential application of ALD since early years has been catalysis, which was e.g. one of the focus areas of Mikrokemia Oy in 80ies and 90ies. Even though the significant commercial breakthroughs of ALD have been done in the other fields than catalysis, the research on ALD in catalysis is still going strong e.g. by prof. Riikka Puurunen at Aalto University.

Finnish Catalysis Society congratulates Tuomo Suntola!

Juha Lehtonen

Chairman

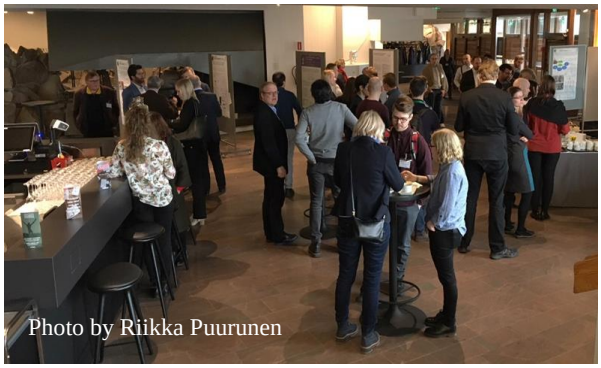
Katse

Suomen katalyysiseura
Finska katalyssällskapet
Finnish Catalysis Society

JÄSENKIRJE 1/2018

3rd Finnish Young Scientist Forum on Catalysis

Last April 6, 2018, the third Finnish Young Scientist Forum on Catalysis (FYSFC) took place in Otaniemi, Espoo, organized by the Finnish Catalysis Society. The Forum is a relaxed, yearly event, where PhD students from Finnish Universities get the chance to present their work to their peers, professors, and other Catalysis professionals. The event is also a great opportunity for the members of the Catalysis community in Finland to network and catch up with each other. This year, the organization of the Forum was in charge of Professor Riikka Puurunen from Aalto University. The venue was the landmark Dipoli building in Aalto University's Otaniemi campus.

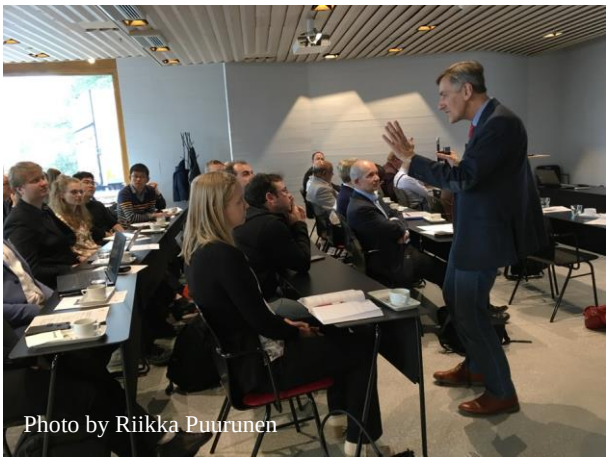


Participants of the FYSFC 2018 enjoying a coffee break in Dipoli building's Juhla-aula.

This year, 55 participants attended the FYSFC, of which 12 delivered oral presentations. Additionally, the event hosted for the first time a poster section, featuring 10 presentations. Two students got the chance to pitch their posters to the audience before the lunch break.

Remarkably, the Forum kicked off with an engaging plenary lecture by Professor Krijn de Jong from Utrecht University, the Netherlands. One additional highlight of the FYSFC 2018 was the declaration of the winner of the competition for the new logo of the Finnish Catalysis Society. As in previous occasions, the Forum was followed by the annual meeting of the Society and closed with a buffet dinner and get-together.

The title of Professor de Jong's lecture was 'Effects of size and location of metal nanoparticles in catalysis'. The professor opened the lecture by highlighting various challenges that climate change poses, which catalysis can address. He then focused on Fischer-Tropsch technology for the deployment of syngas as an alternative feedstock. With this instance as a case study, he proceeded to describe the means to control the size and location of particles in Fischer-Tropsch catalysts, as well as their effects on activity, selectivity, and stability.



Professor Krijn de Jong interacting with the audience.

Some of the PhD students who participated in the event also delivered oral presentations on Fischer-Tropsch synthesis and water-gas shift. Other popular topics included aqueous phase reforming and upgrading of biomass derivatives such as furfural, butanol, fatty acids, and guaiacol. Furthermore, there were presentations dealing with biomass-based

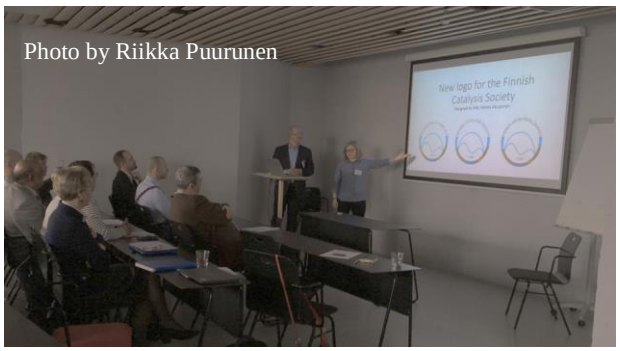
Katse

Suomen katalyysiseura
Finska katalyssällskapet
Finnish Catalysis Society

JÄSENKIRJE 1/2018

catalysts for water purification, methanol-fueled solid oxide fuel cells, and mesoporous nanoparticles as ligands for palladium complexes in the Heck reaction.

In autumn 2017, the Finnish Catalysis Society opened a call for designs to replace its old logo. The competition closed in February 15, 2018 and the winner was announced in the FYSFC by Professor Juha Lehtonen, chairman of the Society. Minttu Kauppinen from the University of Jyväskylä authored the winning design, which she unveiled before the audience.



Unveiling of the new logo of the Finnish Catalysis Society.

The FYSFC 2018 closed with a brief farewell by Professor Lehtonen, who also invited the participants to join the gathering and dinner, which would follow the annual meeting of the Finnish Catalysis Society. The participants left the Dipoli building after a fruitful day of learning, sharing, and commenting. As the event combined quality research with a comfortable, welcoming environment, one could only look forward to next year's Finnish Young Scientist Forum on Catalysis.

José Luis González Escobedo

Please give feedback on organization of the Young Scientist Forum

The Finnish Catalysis Society is collecting feedback on the FYSFC2018 event, with the goal to develop the event further for next year. All Finnish Catalysis Society members are welcome to give feedback, regardless of whether or not you were present at this year's event. Feedback is collected through the following link (it is a Google Forms survey): **https://goo.gl/forms/wy0NCJIcv0o2k88W2.** The feedback survey is anonymous; and answering should not take more than 5-10 min of your time. The survey will be open for answering until August 31, 2018.

New logo of the Society

The Finnish Catalysis Society proudly announces the new logo of the Society.

The winner of the logo competition organized by the board of Finnish Catalysis Society, PhD student Minttu Kauppinen from the University of Jyväskylä, describes the new logo as follows:

"The circular shape of the logo represents the catalytic cycle, and the arches inside it depict a catalyzed and un-catalyzed reaction profile, as the competition specified that the logo had

Katse

Suomen katalyysiseura
Finska katalyssällskapet
Finnish Catalysis Society

JÄSENKIRJE 1/2018

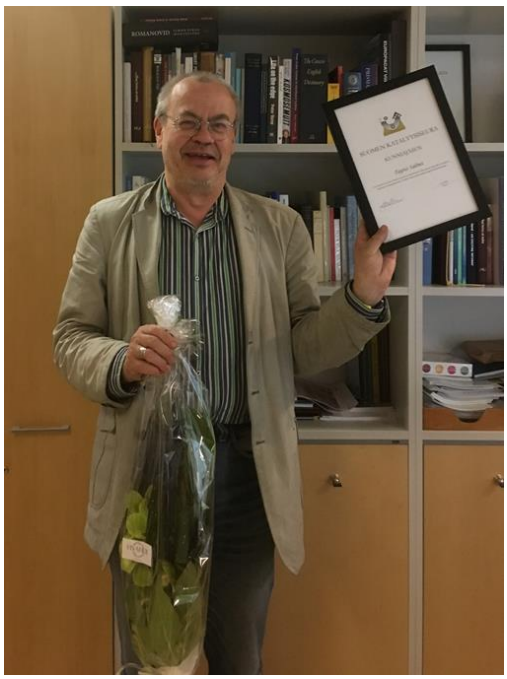
to describe catalysis. I included the name and founding year of the society, as it makes the logo more informative for anyone not already aware of the society. The logo is available in Finnish, Swedish, and English. The background photo was taken by me last summer at Siikasaari in Lake Päijänne, which to me looks incredibly Finnish. The shades of blue for the arches were taken from the sky and the water in the picture. My original idea for the logo was a very minimalistic one, so that it would stand the test of time. With that in mind, I made simplified versions of the logo without the background picture, just in case"

Tapio Salmi awarded honorary membership of the Finnish Catalysis Society

The Finnish Catalysis Society decided unanimously to award Professor Tapio Salmi from Åbo Akademi University as an honorary member of the Society.

Professor Salmi has made a tremendous contribution in the fields of catalysis and chemical reaction engineering, both in Finland and internationally. Tapio's work has been well recognized and the list of merits and awards is long and broad. He has acted as Academy professor 2009-2013 and was recently re-appointed for the period 2019-2024. Prizes and memberships include the prestigious Magnus Ehrnrooth Prize for research in chemistry and Honorary membership of Czech Society of Chemical Engineering, as well as, memberships in Societas Scientiarum Fennica and the Finnish Academy of Sciences. Moreover, the city of Turku/Åbo awarded the Congress Prize for organizing the Europacat VIII conference.

With this honorary membership, the Finnish Catalysis Society wanted to recognize Tapio for his excellent scientific merits in catalysis, his efforts in teaching and promoting the subject and his activities in the global catalysis community.



Professor Tapio Salmi with the honorary diploma

Tapio Salmi became Academy Professor again

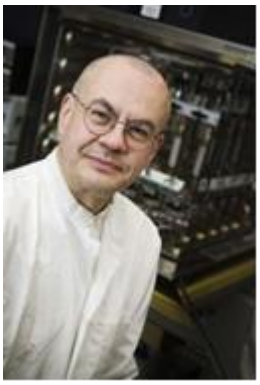
Tapio Salmi, professor in chemical reaction engineering at Åbo Akademi has been elected Academy Professor for the term 1.1.2019-2023. 190 scientists applied for this highest researcher position in Finland, and Academy of Finland selected 10 of them to new Academy Professors. The research topic of prof. Salmi will be 'Towards deep understanding of multiphase molecular processes by application of transient experimental techniques and mathematical modelling.' The research is focused on selected oxidation reactions of molecules

Katse

Suomen katalyysiseura
Finska katalyssällskapet
Finnish Catalysis Society

JÄSENKIRJE 1/2018

originating from biomass. In situ spectroscopic techniques and advanced mathematical modelling will be applied to reveal reaction mechanisms and to describe the rates of catalytic surface processes. Tapio Salmi is one of the few Finnish scientists who have been appointed Academy Professor twice; the previous term of his Academy Professorship was 2009-2013.



Prof. Tapio Salmi

Catalysis related dissertations

M.Sc. (Eng.) Marja Kärkkäinen from Faculty of Technology, Environmental and Chemical Engineering Research Unit, University of Oulu defended her thesis on 8th of December, 2017. The title of her thesis was

"Deactivation of oxidation catalysts by sulphur and phosphorus in diesel and gas driven vehicles"

Opponent: Prof. Lars Pettersson, KTH Royal Institute of Technology, Sweden

Custodian: Prof. Riitta Keiski, University of Oulu

Abstract:

The combustion of fuels in motor vehicles is one of the most significant causes of air emissions. The use of oxidation catalysts in exhaust gas emission treatment can reduce hydrocarbons (HCs) and carbon monoxide (CO) emissions by more than 90%. Fuels and engine lubricants contain impurities like sulphur (S) and phosphorus (P), which can have a significant effect on the activity and durability of oxidation catalysts.

This thesis aims at increasing the current knowledge of the deactivation phenomena caused by sulphur and phosphorus in diesel and natural/bio gas oxidation catalysts. Accelerated laboratory scale sulphur, phosphorus and thermal treatments in gas-phase conditions were carried out for alumina (Al_2O_3) based platinum (Pt) and platinum-palladium (PtPd) metallic monolith diesel and natural gas oxidation catalysts. In addition, a vehicle-aged natural gas oxidation catalyst and an engine-bench-aged diesel oxidation catalyst were studied and used as a reference for the laboratory-scale-aged catalysts. BET-BJH, FESEM, TEM, XPS and DRIFT were used as characterization techniques to determine changes on the catalysts. The effect of accelerated deactivation treatments on the catalyst activity was determined using laboratory scale measurements in CO, HC and nitric oxide (NO) oxidation.

Sulphur and phosphorus were found to cause morphological and chemical changes on the studied catalysts. Sulphur was found to be adsorbed vertically throughout the entire catalyst support from the catalyst surface to the metallic monolith, while phosphorus accumulated on the surface region of the precious metal containing catalysts. Both, sulphur and phosphorus, slightly increased the average size of the precious metal

particles size and are adsorbed onto the alumina by chemical bonds. In addition, a partial transformation from PdO to Pd and a change in the shape of the precious metal particles due to phosphorus were detected. Due to the detected structural and chemical changes on the catalysts, sulphur and phosphorus treatments reduced the catalytic activity of the studied diesel and natural-gas-oxidation catalysts. Correspondence between real and simulated ageing was found and thus the used accelerated laboratory scale aging method can be stated to be a good tool to simulate sulphur and phosphorus exposure.

M.Sc. (Eng.) Imamne Hachemi from Laboratory of Industrial Chemistry and Reaction Engineering, Abo Akademi University defended her thesis on 18th of June, 2018. The title of her thesis was

"Catalytic transformation of algae, tall-oil fatty acids and triglycerides to renewable fuels and chemicals"

Opponent: Prof. Anker Degn Jensen, Technical University of Denmark (DTU), Denmark

Custodian: Prof. Dmirtry Yu. Murzin, Åbo Akademi University

Abstract:

It has become increasingly obvious that sustainable energy is becoming more engaging owing to the eventual depletion of the world reserves of fossil resources of energy and to the increase of the greenhouse gas emissions. Numerous feedstocks are utilized to produce biofuels and biodiesel; however, it is vital that the production does not compete with food resources. Therefore, second generation biofuels produced from algal biomass, lignocellulosic material and waste oil are receiving much attention. Algae as a feedstock for biomass are not competitive with the food supply, their growth rate is faster compared to terrestrial plants and they do not require arable lands to be cultivated. Moreover, algal mass can be fractionated allowing the production of several valuable products. Chlorella microalga fractionation was carried out using different methods, namely direct saponification, in situ transesterification and supercritical hexane extraction.

Fatty acids have high molecular weights and energy densities and would, thus, be suitable feedstock for biodiesel. However, there are a number of refining issues related to algal derived oil, which require further processing, such as lowering of the high oxygen content in the crude oil. Hydrodeoxygenation is an alternative and attractive method for upgrading biodiesel feedstock into a compatible diesel fuel for engines. Catalytic screening using sulfur-free catalysts and reaction condition optimization allowed the enhancement of the reactant conversion and the product yield leading to an increased selectivity towards aliphatic hydrocarbons. Nickel supported on HY-80 zeolite catalyst containing 5 wt% metal was synthesized and characterized by various methods. Different fatty acids were hydrodeoxygenated in a semibatch reactor at 30 bar and 300 °C. Kinetic studies of the hydrodeoxygenation permitted establishing plausible reaction mechanisms and different pathways for the reactions. A kinetic model for the hydrodeoxygenation was developed and successfully applied to the experimental data. Behavior of real feedstock was intensively investigated utilizing both 5 wt% Ni/HY-80 and 5 wt% Pd/C catalysts under similar

Katse

Suomen katalyysiseura
Finska katalyssällskapet
Finnish Catalysis Society

JÄSENKIRJE 1/2018

conditions. The catalyst reusability, deactivation and regeneration were given high importance and thoroughly examined.

Conferences and symposia

PREPA12 – 12th International Symposium on the "Scientific Bases for the Preparation of Heterogeneous Catalysts"
July 8-12, 2018, Louvain-La-Neuve, Belgium
https://www.ldorganisation.com/v2/page/prepa/products.html

Gold 2018
July 15-18, 2018, Paris, France
http://www.gold2018.org/

18th Nordic Symposium on Catalysis
August 26-28, 2018, Copenhagen Denmark
http://www.conferencemanager.dk/NSC2018

CAPoC11 — Eleventh International Congress on Catalysis and Automotive Pollution Control
October 29-31, 2018, Brussels, Belgium
http://capoc.ulb.ac.be/

14th EuropaCat – European Congress on Catalysis "Catalysis without borders"
August, 18-23, 2019, Aachen, Germany
www.europacat2019.eu

Catbior2019 in Turku!
A top-level international scientific event, the 5th International Congress on Catalysis for Biorefineries, Catbior2019, will be held in Turku/Åbo, in the conference and cultural centre Logomo from Monday, September 23 to Friday, September 27, 2019.

The 1st Catbior originated in 2011 in Malaga. Since then, the congress alternates worldwide in odd years: the 2nd congress was held in Dalian in 2013 followed by congresses in Rio de Janeiro in 2015 and Lyon in 2017.

Catbior2019 covers all aspects of application of catalysis on biorefineries, particularly

- Fundamental and applied catalysis in biorefinery
- Molecular insights in processing of biomass
- Utilization of lignocellulosic, algal biomass, vegetable oils and other biomass
- Industrial demonstrations
- Catalysis in its variety – homogeneous, enzymatic and heterogeneous catalysis

The Scientific programme of CatBior2019 consists of plenary and keynote lectures as well as oral and poster presentations.
The invited plenary lecturers are: Prof. Raghunath V. Chaudhari, The University of Kansas; Dr Ville Nieminen, Raisio Group; Dr Catherine Pinel, IRCELYON, Lyon-Villeurbanne; Prof. Keiichi Tomishige, Tohoku University; and Prof. Dionisios G. Vlachos, University of Delaware.

Please, visit the website www.catbior2019.fi and join the conference!
See also e.g.

www.conference-service.com

www.iacs-icc.org/Events/events.html

Web pages

http://www.katalyysiseura.org

http://www.kemianseura.fi

http://www.efcats.org

Katse

Suomen katalyysiseura
Finska katalyssällskapet
Finnish Catalysis Society

JÄSENKIRJE 1/2018

Board of the Finnish Catalysis Society 2018

Chairman
Research professor Juha Lehtonen
VTT Technical Research Centre of Finland Ltd
POB 1000, FI-02044 VTT
tel. +358 50 407 1075
e-mail: firstname.lastname at vtt.fi

Vice-Chair
Prof. Karoliina Honkala
Department of Chemisrty, Nanoscience Center
POB 35, FI-40014 University of Jyväskylä
tel. +358 40 805 3686
e-mail: firstname.lastname at jyu.fi

Secretary
Adj. prof. Mika Huuhtanen
University of Oulu/Faculty of Technology/
Environmental and Chemical Engineering
POB 4300, FI-90014 University of Oulu
tel. +358 29 448 2377
e-mail: firstname.lastname at oulu.fi

Treasurer
Ms. Salla Jaatinen
Neste Oyj, Research and Development
POB 310, FI-06101 Porvoo
tel: +358 50 458 7461
e-mail: firstname.lastname at neste.com

Members of the board

Prof. Riikka Puurunen
Aalto University
School of Chemical Engineering
POB 16100, FI-00076 Aalto
tel. +358 50 3378 161
e-mail: firstname.lastname at aalto.fi

Assoc. prof. Henrik Grénman
Åbo Akademi/Molekylär process- och
materialteknik/Teknisk kemi och
reaktionsteknik,Processkemiska centret
Biskopsgatan 8, FI-20500 Åbo
tel. +358 2 215 4574
e-mail: förnamn.efternamn at abo.fi

Alternate members

D.Sc.(Tech.) Teuvo Maunula
Dinex-Ecocat Oy
Global Catalyst Competence Center
POB 20, FI-41331 Vihtavuori
tel. +358 50 5866 200
e-mail: tma at dinex.fi

Ph.D. Anne Heponiemi
University of Oulu/Faculty of Technology/Sustainable Chemistry
POB 3000, FI-90014 University of Oulu
tel. +358 50 571 5560
e-mail: firstname.lastname at oulu.fi

Board of the Finnish Catalysis Society 2018
(Dr Teuvo Maunula missing)

The Board of the Finnish Catalysis Society wish to get feedback about the Katse letter from the members of the society. In addition, please send news and information of activities e.g. doctoral dissertations, national and international events, prizes, and courses to be published in the Katse. The feedback and news can be sent to the Board members. Thank you.