



Conference Program for Impacts of Fuel Quality, September 19th - 23th, 2022, Åre, Sweden

Sunday 18 th September	
4:00-6:00 PM	Welcome get together/Registration Dinner open 6:pm – 8:pm

Monday 19 th September (Day One)				
07:00-08:00 AM	Breakfast			
Session 1: Fuel Quality and Combustion Performance I Chair: TBD				
8:00 am	Welcome & info	Stan & Markus		
8:05 am	Keynote: Combustion technology development – How has academic research contributed?	Mikko Hupa		*52
8:45 am	Full-scale investigations of initial deposits formation in a cement plant co-fired with coal and SRF	Anne Juul Damø		28
9:10 am	The influence of sulfur recirculation on deposit formation in waste-to-energy plant	Wenhan Cao		22
9:35 am	Effect of contribution of lignite in blend with hard coal on kinetics co-pyrolysis and co-combustion	Halina Pawlak et al		54
10:00 am	Tea Break until 10:30 am			
Session 2: Ash Utilization & Valorization Chair: TBD				
10:30 am	Keynote: Recent advances in our understanding of phosphorus reactions in high-temperature processes	Nils Skoglund		*50
11:00 am	Release of phosphorus and alkali species from agricultural waste during gasification	Daniel Schmid		15

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11:25 am	Thermochemical equilibrium study of ash transformation during entrained flow combustion and gasification of agricultural residues focusing on the potential extraction of valuable Si, K – P compounds	Samarthkumar Pachchigar		11
11:50 am	Characterisation of ash particles from co-combustion of bark and sludges from pulp and paper industry	Anna Strandberg		37
12:15 – 1:30pm	Lunch			
	Ad-hoc meetings/Networking			
6:00 – 7:30 pm	Dinner			
Session 3: Modeling and beyond I: Chair: TBD				
7:30 pm	Keynote: Accumulation and Communication of Ash Research	Flemming Frandsen		*51
8:10 pm	Sewage sludge gasification in batch induction reactor – work in progress	Tadeusz Mączka		54
8:35pm	Determination of the fuel composition during operation to optimise the combustion behavior	Antje David		14
9:00 pm	Happy Hour			

Tuesday 20 th September (Day Two)				
07:00-08:00 AM	Breakfast			
Session 4: Modeling and beyond II: Chair: TBD				
8:30 am	Keynote: The Atikokan Digital Twin: Bayesian Physics-Based Machine Learning for Low-Load Firing in the Atikokan Biomass Utility Boiler	Philip Smith		*3
9:10 am	A deep learning approach to classification and evaluation of particulate matter (PM) emissions during co-firing of coal	Yoshihiko Ninomiya		8
9:35 am	On the Use of Global Equilibrium Analysis to Interpret	Flemming J. Frandsen		7

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	Ash and Trace Element Chemistry			
10:00 am	Tea Break until 10:30 am			
Session 5: Fuel Quality and Combustion Performance II Chair: TBD				
10:30 am	Firing Blends of Biomass and Coal in a Coal-fired Utility Boiler without Hardware Modifications	Andrew Fry		30
10:55 am	Upgrading Low Rank Coals Using the Integrated SynCoal Process	Harry Bonner		4
11:20 am	Pre-combustion Quality Issues Related to Thermally Upgraded Biomass Fuels	Stan Harding		2
11:45 am	Effect of residual char and atmospheric gases on clinker formation from woody/herbaceous biomass ashes	Kenji Koido		23
12:10 – 1:30 pm	Lunch			
	Ad-hoc meeting/Networking/Excursion			
1:30 pm	Excursion bus leaving Holiday Club			
4:00 pm	Excursion bus returning to Holiday Club			
6:00 – 7:30 pm	Dinner			
Session 6: Corrosion I Chair: TBD				
7:30 pm	Experiences from eight years of firing demolition wood using ammonium sulphate to mitigate superheater corrosion	Håkan Kassman		58
7:55 pm	Changes in chlorine content over time – probe deposit sampling in a Finnish kraft recovery boiler	Roland Balint		55
8:20 pm	Aggressive cold-end corrosion caused by ammonium chloride in biomass boilers utilizing additives	Emil Vainio		44
8:45 pm	Happy Hour			

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Wednesday 21 st September (Day Three)				
07:00-08:00 AM	Breakfast			
Session 7: Corrosion II Chair: TBD				
8:30 am	Corrosion of superheater materials by alkali chloride salt mixtures – The role of presence of molten phase	Emil Vainio/Patrik Yrjas		42
9:55 am	Low temperature corrosion caused by CaCl ₂	Alessandro Ruozzi		43
9:20 am	The effect of Cl, Br, and F on high-temperature corrosion of heat-transfer alloys	Juho Lehmusto		18
9:45 am	Tea Break until 10:30 am			
Session 8: Aerosols and Deposits Chair: TBD				
10:30 am	On the Ash Deposition Behavior and Fine Particle Formation When Utilizing Biomass Together with Coal Fly Ash in Pilot- and Full-Scale	Flemming J. Frandsen		10
10:55 am	Utilising Thermodynamic Equilibrium Calculations to Model Potassium Capture by Additives in Biomass Combustion Plants	Thorben de Riese		27
11:20 am	Comparison of Coal Fly Ash Injection Techniques on Combustion Aerosols in a Full-Scale Boiler Firing Wood	Richard Nowak Delgado		35
11:45 am	Towards prediction of ash deposition rates from combustion of a wide variety of fossil and biomass solid fuels	Jost O.L. Wendt		19
12:10 – 1:30pm	Lunch			
Session 9: Ash Transformation Chair: TBD				
1:30 pm	Impact of fuel blends in co-firing on coal and biomass ash deposition characteristic in pulverized fuel combustion	Abdou Suso		39
1:55 pm	Release of Phosphorus from Thermal Conversion of Biomass - Evidence for Carbothermic	Emil O. Lidman Olsson		29

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	Reduction of Phosphates in Wheat Bran			
2:20 pm	Kaolin as fuel additive in grate combustion of biomass to mitigate ash related problems and particle emissions	Eleonora Borén		17
2:45-3:15 pm	Tea Break until 3:15 pm			
3:15 pm	Use of bamboo as biomass CHP fuel in Japan	Kenichi Sasauchi		6
3:40 pm	Pyrolysis of municipal sewage sludge (MSS) in a rotary pyrolyser- analysis of the char chemistry and heavy metal mobilization-Modelling and experiments	Naeimeh Vali		24
4:05 pm	Ad-hoc meeting/Networking Executive & Scientific committee meeting			
6:00 – x:00 pm	Conference Dinner			

Thursday 22 nd September (Day Four)				
07:00-08:00 AM	Breakfast			
Session 10: Diagnostics Chair: TBD				
8:30 am	Real-time in situ quantification of gaseous K, KOH and KCl in biomass combustion and gasification	Emil Thorin		45
8:55 am	Detection of Alkali Path in a Pilot-Scale Combustor Using Laser Spectroscopy and Surface Ionization – From Flame to Particles	Jan Viljanen		13
9:20 am	Quantitative imaging of K species in biomass combustion and gasification	Emil Thorin		46
9:45 am	Tea Break until 10:30			
Session 11. Non-Power Processes I Chair: TBD				
10:30 am	Characterization of biocarbon produced from woody biomass for metallurgical applications	Liang Wang		60
10:55 am	TBA	José Aguirre Castillo		48

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11:20 am	Infiltration of olive pomace ash and coal ash into magnesium oxide-based refractories	Naresh Kumar Wagri		34
11:45 am	Experimental evaluation of different alternative fuel combustion under oxyfuel conditions for cement production	Cynthia Kroumian		40
12:10 – 1:30pm	Lunch			
	Ad-hoc meeting/Networking			
6:00 – 7:30 pm	Dinner			
Session 12. Bed Agglomeration				
Chair: TBD				
7:30 pm	Recent experiences from fluidized combustion tests with bed materials of varying quartz content	Jaakko Tamminen		32
7:55 pm	Bed layer Formation Characteristics in Quartz and Feldspar Bed Particles during Fluidized Bed Combustion of Woody Biomass: A comparative study Using X-ray Microtomography	Ali Valizadeh		26
8:20 pm	Bed particle layers characteristics and formation process during fast pyrolysis of grass	Fanfan Xu		12
8:45 pm	Happy Hour			

Friday 23rd September (Day Five)				
07:00-08:00 AM	Breakfast			
Session 13: Fuel Quality and Combustion Performance III				
Chair: TBD				
8:00am	Expanding the Utility of Laboratory Fuels Testing	David R. Wagner		62
8:25am	Massive scale, low-cost capture and sequestration of carbon dioxide into unconventional rocks	John M Pope		59
8:50am	Oxy-fuel combustion characteristics of wooden and non-wooden biomass in a pilot-scale bubbling fluidized bed combustor	Matěj Vodička		31

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9:15am	Image-Based Biomass Characterization Comparison of Conventional Image Processing and a Deep Learning Approach	Johannes Lukas		36
9:40am	Tea Break until 10:30			
Session 14. Non-Power Processes II Chair: TBD				
10:30am	Investigation of the Properties and Reactivity of Biocarbons at High Temperature in a Mixture of CO/CO ₂	Liang Wang		63
10:55am	An experimental study on mineral particle deposit formation and sintering in cement calciner	Hao Wu		21
11:20am	High-temperature sintering behavior of clays during calcination – a preliminary study	Yifan Du		16
11:45am	Ash-Limestone Interactions in Quicklime Production	Markus/Matias		47
12:15 – 13:00	Prize Distribution & Good Bye			
13:00	Lunch (Take Away)			