

MIKKO HUPA

1. PERSONAL INFORMATION

Name: Mikko Markus Hupa
Birth date and place: 12.09.1952, Helsinki
Nationality: Finnish

Marital status: Married, two children
Language skills: Native: Finnish and Swedish, fluent: English and German



2. EDUCATION

1980 **PhD**, Chemical Engineering, Åbo Akademi University (AAU)
Doctoral thesis: *"Fireside deposits in combustion of bark"*
Major subject: Inorganic Chemistry, High-Temperature Processes
1975 **MSc**, Chemical Engineering, AAU

3. ADJUNCT PROFESSORSHIPS

Docent in Combustion Chemistry, Tampere University of Technology, 1990
Competent for Full Professorships in Combustion Engineering, Chalmers University of Technology, 1986 and in Energy Technology, Helsinki University of Technology, 1992

4. PRESENT EMPLOYMENT RELATIONSHIPS

2012-2014 **Vice rector** (research affairs), AAU
1998- **Professor** in Inorganic Chemistry, AAU

5. PREVIOUS EMPLOYMENT RELATIONSHIPS

1992-1997 **Professor**, Chemical Combustion Engineering, AAU
1987-1997 **Research Director**, National Combustion Research Program LIEKKI, AAU

6. VISITS ABROAD

2006 **Visiting Professor**, Technical University of Denmark
1981 **Visiting Scientist**, University of Toronto
1976-1977 **Project Manager** (construction projects), Rakennustoimisto Eero Nuutinen Oy, Jeddah, Saudi Arabia

More than 60 professional visits to North-America

7. SCIENTIFIC AND ACADEMIC ADMINISTRATIVE POSITIONS

1998- **Professor**, Inorganic Chemistry, AAU
1995- **Director, Chairman of the Board**, Graduate School in Chemical Engineering (GSCE) in Finland
2012-2014 **Vice rector** (research affairs), AAU
2000-2011 **Director, Chairman of the Board**, Åbo Akademi Process Chemistry Centre, Centre of Excellence in Research, nominated by the Academy of Finland
2003-2010 **Director, Chairman of the Board**, Nordic Graduate School in Biofuel Science and Technology
2006-2009 **Dean**, Faculty of Technology, AAU
2006-2008 **President**, International Flame Research Foundation (IFRF)
1999-2002 **Superintendent**, Research Director of the IFRF
1987-1999 **Director**, Research for the National Combustion Research Program LIEKKI

8. SCIENTIFIC ACKNOWLEDGEMENTS AND AWARDS, MEMBERSHIPS IN SCIENCE ACADEMIES

Honours and Prizes

- Two Best Paper Awards at International Chemical Recovery Conference 2010, Williamsburg, VA, USA.
- **Prize of Recognition by the Fortum Foundation, 2005**
- Best Paper Award at International Chemical Recovery Conference in Charleston, SC, USA, 2004
- Environmental Prize by the Magazine “Ympäristö ja Tekniikka”, 2002
- Best Paper Award at TAPPI Engineering Conference, Corrosion and Materials Engineering Committee, 2000
- Best Paper in the PFBC Design Section, 14th International Conference on Fluidized Bed Combustion, 1997
- Lecturer of the Year by the Chemical Engineering Student Association at Åbo Akademi University, 1996
- “Finest Faculty” by the Technical Association of the Pulp and Paper Industry (TAPPI), 1994
- **International Walter Ahlström Prize by the Academies of Technology (with A. Sarofim and G. De Soete), 1993**
- Forest Industry of Finland University Award, 1988
- Best paper at the 5th International Symposium on Corrosion in the Pulp and Paper Industry, Canada, 1986

Honorary Memberships in Scientific Academies

- Suomalainen Tiedeakatemia (Finnish Academy of Science and Letters) 2011-
- Svenska Tekniska Vetenskapsakademien (Swedish Academy of Science and Technology) in Finland, Member 1992-, Steering Board Member 2009-
- TAPPI Fellow (Technical Association of the Pulp and Paper Industry in the U.S.) 2005-
- TAPPI International Research Management Committee 2009-
- Finska Vetenskaps societeten (Finnish Society of Sciences and Letters), 2002-

9. RESEARCH FUNDING

Project funding granted from 2001 onwards 2 – 2,5 M €/year, total last 10 years c 22 M €

- FUSEC, “Future Fuels for Sustainable Energy Conversion”, (2011-2013). Funding: Tekes, industrial consortium, total 4 M€ (our part 1,150,000 €).
- Tekes-ChemEner, “Chemical energy-based processing of complex materials” (2012-2013). Funding: Tekes, our part 333,000 €.
- CLEEN-Diesel, “Future Combustion Engine Power Plant” (2010-2012). Funding: The SHOK CLEEN, Tekes, industrial companies; our part 170,000€.
- EU-BRISK, The European Infrastructure for Thermochemical Biomass Conversion (2011-2015), our part 330,000 €
- EU-RELCOM, “Reliable and Efficient Combustion of Oxygen/Coal/Recycled Flue Gas Mixtures” (2011-2015), our part 320,000 €
- Tekes-ERANET, “Scientific Tools for Fuel Characterization for Clean and Efficient Biomass Combustion” SciToBiCom (2010-2012). A European project, our part 558,000 €.
- FA symbiosis, “Systems optimization of manufacturing of biofuels and steel in an integrated site” (2011-2015), funding from Academy of Finland, our part 430,000 €.
- FA MoreBAGS, “Structure of gradient nanocomposites: interaction of bioactive glasses with nanoparticles and polymers” (2012-2014), Funding: Academy of Finland, our part 300,000 €.
- FA-Brazil, “Feasibility of Finnish and Brazilian biomasses in advanced biorefineries” (2009-2012). Funding: Academy of Finland, our part 200,000 €.
- A number of specific industry projects with total funding c 400,000 € in 2012.

10. RESEARCH LEADERSHIP AND SUPERVISED DOCTORAL THESES

Supervisor or Co-supervisor of 38 PhD Theses, finished since 1992 (listed below), 10 on-going: lisa, Kristiina (*with honours*); Kilpinen, Pia (*with honours*); Skrifvars, Bengt-Johan; Yrjas, Patrik; Whitty, Kevin; Konttinen, Jukka; Leppälahti, Jukka; Brink, Anders; Salmenoja, Keijo; Sandelin, Kristoffer; Ylänen, Heimo; Zevenhoven-Onderwater, Maria; Kymäläinen, Maritta (*with honours*); Coda Zabetta, Edgardo; Partanen, Jatta; DeMartini, Nikolai; Theis, Mischa; Moilanen, Antero; Barišić, Vesna; Lindberg, Daniel (*with honours*); Werkelin, Johan; Zhang Di; Arstila, Hanna; Fröberg, Linda; Vedel, Erik; Engblom, Markus; Piispanen, Minna; Enestam, Sonja; Wang, Xiaoju (*with honours*); Vainikka, Pasi (*with honours*); Piotrowska, Patrycja (*with honours*); Bankiewicz, Dorota; Fagerlund, Susanne; Karlström, Oskar (*with honours*); Lehmusto, Juho; Li, Bingzhi; Jones, Frida; Vainio, Emil (*with honours*)

11. OTHER SCIENTIFIC POSITIONS AND SCIENTIFIC ACHIEVEMENTS

- Chairman of the review panel to assess the Department of Chemical Engineering at the Technical University of Denmark, 2014
- Reviewer of more than 20 academic positions at a number of universities including Oregon State University, USA; Institute of Paper Chemistry, Appleton, WI, USA; University of Toronto, Canada; Chalmers University of Technology, Gothenburg; Royal Institute of Technology, Stockholm; Delft University, the Netherlands; University of Oulu, University of Munich, Germany; Aalto University, Helsinki.
- Opponent/Censor at 53 PhD disputations 1986-2014 in a number of universities in Finland, Sweden, Norway, Denmark, the Netherlands, Germany, Australia, Estonia, Canada
- Reviewer of the Swedish Energy Agency's Research Consortium in Materials Technology for Thermal Energy Processes KME 2009
- Member of the Review Panel of Politecnico di Milano Energy Department, Milano, Italy 2007
- Member of the Review Panel of Helsinki University Chemistry Research 2006
- Member of the review panel to review the Swedish Black Liquor Gasification Research Program on request by the Swedish Foundation for Strategic Environmental Research, MISTRA, 2004
- Reviewer of High Temperature Combustion Technology Program by Swedish Energy Agency, 2004
- Review Panel member to evaluate the Energy Technology Center in Piteå, Sweden, 1998
- Review Panel member to evaluate the Cooperative Research Centre For Black Coal Utilization in Australia, 1998
- Reviewer of the Danish Frame Programme on Combustion and Harmful Emissions Control, 1995
- Editorial Board Member of Fuel, 2006-, Clean Air: International Journal on Environmental Combustion Technologies, 2000-, IFRF Combustion Journal, 1999-.
- Referee of manuscripts (10-15 per year) submitted to international journals including: Chemical Engineering Journal, Chemical Engineering Science, Combustion and Flame, Energy and Fuels, Fuel, Industrial and Engineering Chemistry Research, Journal of the Pulp and Paper Science, Symposium (International) on Combustion, TAPPI Journal

Organizing Conferences and Seminars (Selected International)

- Chairman of the 22nd International Conference on Fluidized Bed Conversion, Turku, Finland, June 2015
- Chairman of the International Conference "Impacts of Fuel Quality on Power Production and the Environment" in Saariselkä, Lapland, Finland, August 2010
- Chairman of the International Flame Research Foundation (IFRF) Topic Oriented Technical Meeting TOTeM "Challenges in Rotary Kiln Combustion Processes" in Pisa, Italy 2009
- Colloquium co-chairman at the International Symposium on Combustion by the Combustion Institute: 26th in San Francisco (1996), 27th in Edinburgh (1998), and 29th in Sapporo (2002)

- Program Committee Member of the TAPPI/CPA “International Conference on Recovery of Pulping Chemicals”, New Orleans, LA, USA, 1984, Ottawa, ONT, Canada, 1989, Seattle, WA, USA, 1992, Toronto, ONT, Canada, 1995, Charleston, SC, USA, 2004
- Conference Chairman of the same in Whistler, BC, Canada 2001
- Organizer and Chairman of the “6th International N₂O Workshop”, Åbo, 1994

Invited Lectures (Selected International)

- Distinguished Lecturer at the Department Chemical Engineer, University of Utah, Salt Lake City, UT, USA, February 2009
- Invited Plenary Lecturer at the “Energy from Biomass and Waste Workshop” by the CWEG Eco-STAR consortium, the Korea Society of Waste Management and SK C&E, May, at the University of Seoul, Seoul, Korea 2009
- Invited lecture at the International CFB Conference, Hamburg, Germany 2008
- Invited lecture at the TAPPI Fall Meeting, Atlanta, GA, USA, 2006
- Invited lecture at the course “Options for Energy Recovery from Municipal Solid Waste”, Politecnico di Milano, Piacenza, Italy, 2005
- Invited plenary lecture at the “International Flame Research Foundation Members Conference”, Noordwijkerhout, the Netherlands, 2004
- Invited plenary lecture at the “International Fluidized Bed Combustion Conference”, Jacksonville, Florida, 2003
- Invited lecture at the “International Symposium on Coal and Biomass Utilization: Energy and Environment”, University of Newcastle, Australia 2003
- Invited "Distinguished Lecturer" at the Department of Chemical Engineering of the University of Toronto, 2002
- Lecturer at the EU-China Clean Coal Course “Fluidized Bed Combustion Technology for Coal”, Shanghai, China, 1997
- Invited plenary lecture at the “International Coal Gasification Symposium” by the Japanese Association of Chemical Engineers and Tokyo University of Agriculture and Technology, Tokyo, Japan 1996
- Lecturer and instructor at the annual “TAPPI Kraft Recovery Operations Short Course”, Orlando, FL, USA, 1986-2011 altogether 26 times

12. SCIENTIFIC AND SOCIETAL IMPACT OF OWN RESEARCH

No. of refereed publications: 363 (Thomson Reuters Web of Science), Average citations per item: 10.91, h-index: 32 (August 2014)

Five relevant publications for the project:

Aho, A., Kumar, N., Eränen, K., Salmi, T., Hupa, M., Murzin, D.Yu., Catalytic pyrolysis of woody biomass in a fluidized bed reactor: Influence of the zeolite structure, *Fuel* 87 (2008) 12, 2493-2501

Öhman, M., Nordin, A., Skrifvars, B.-J., Backman, R., Hupa, M., Bed agglomeration characteristics during fluidized bed combustion of biomass fuels, *Energy & Fuels* 14 (2000) 1, 169-178

Shoulaifar, T.K., DeMartini, N., Zevenhoven, M., Verhoeff, F., Kiel, J., Hupa, M., Ash-forming matter in torrefied birch wood: changes in chemical association, *Energy & Fuels*, 27 (2013) 10, 5684-5690

Werkelin, J., Skrifvars, B.-J., Zevenhoven, M., Holmbom, B., Hupa, M., Chemical forms of ash-forming elements in woody biomass fuels, *Fuel* 89 (2010) 2, 481-493

Khazraie Shoulaifar, T., DeMartini, N., Ivaska, A., Fardim, P., Hupa, M., Measuring the concentration of carboxylic acid groups in torrefied spruce wood, *Bioresource Technology* 123 (2012), 338-343

