



Editors

Valeri Mladenov
Tasho Tashev
Hui Wang
Ivan Kralov
Sergey Stankevich
Pelin Yildiz
Jon Burley



Recent Advances in Energy and Environmental Management

- Proceedings of the 8th International Conference on Energy & Environment (EE '13)
- Proceedings of the 7th International Conference on Geology and Seismology (GES '13)
- Proceedings of the 1st International Conference on Environmental Management in Construction (EMC '13)
- Proceedings of the 6th International Conference on Urban Rehabilitation and Sustainability (URES '13)

Rhodes Island, Greece, July 16-19, 2013

Scientific Sponsors





RECENT ADVANCES in ENERGY and ENVIRONMENTAL MANAGEMENT

**Proceedings of the 8th International Conference on Energy &
Environment (EE '13)**

**Proceedings of the 7th International Conference on Geology and
Seismology (GES '13)**

**Proceedings of the 1st International Conference on Environmental
Management in Construction (EMC '13)**

**Proceedings of the 6th International Conference on Urban
Rehabilitation and Sustainability (URES '13)**

**Rhodes Island, Greece
July 16-19, 2013**

Scientific Sponsors:



**Technical University of
Sofia, Bulgaria**



**Polytechnic University
of Bari, Italy**



**University Politehnica of
Bucharest, Romania**

RECENT ADVANCES in ENERGY and ENVIRONMENTAL MANAGEMENT

**Proceedings of the 8th International Conference on Energy &
Environment (EE '13)**

**Proceedings of the 7th International Conference on Geology and
Seismology (GES '13)**

**Proceedings of the 1st International Conference on Environmental
Management in Construction (EMC '13)**

**Proceedings of the 6th International Conference on Urban
Rehabilitation and Sustainability (URES '13)**

**Rhodes Island, Greece
July 16-19, 2013**

Published by WSEAS Press
www.wseas.org

Copyright © 2013, by WSEAS Press

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by no less than two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.
See also: <http://www.worldses.org/review/index.html>

ISSN: 2227-4359
ISBN: 978-960-474-312-4

RECENT ADVANCES in ENERGY and ENVIRONMENTAL MANAGEMENT

**Proceedings of the 8th International Conference on Energy &
Environment (EE '13)**

**Proceedings of the 7th International Conference on Geology and
Seismology (GES '13)**

**Proceedings of the 1st International Conference on Environmental
Management in Construction (EMC '13)**

**Proceedings of the 6th International Conference on Urban
Rehabilitation and Sustainability (URES '13)**

**Rhodes Island, Greece
July 16-19, 2013**

Editors:

Prof. Valeri Mladenov, Technical University of Sofia, Bulgaria.
Prof. Tasho Tashev, Technical University of Sofia, Bulgaria.
Prof. Hui Wang, North Carolina State University, USA.
Prof. Ivan Kralov, Technical University of Sofia, Bulgaria.
Prof. Sergey Stankevich, Scientific Centre for Aerospace Research of the Earth (CASRE), Ukraine.
Prof. Pelin Yildiz, Hacettepe University, Turkey.
Prof. Jon Burley, Michigan State University, USA.

Reviewers:

Mioara Chirita	Monica Dumitrascu
Petr Mastny	Zohreh Salavatizadeh
Ali Salehipour	Rosli Abu Bakar
Hamed Niroumand	Humberto Varum
Irene Zananiri	Ramin Khodafarin
Lamberto Tronchin	Mohamed Salih Dafalla
Konstantinos Vogiatzis	Claudiu Covrig
Gheorghe Mugurel Radulescu	Maria De Fátima Nunes De Carvalho
Gherghinescu Sorin	Kannan Subramanian
Reza Fathipour	Ayca Tokuc
Luis Loures	Dragos Ilie
Mehdi Seyyed Almasi	Denizar Cruz Martins
Maria Wenisch	Adrian Baltalunga
Guoxiang Liu	Alina Adriana Minea
Yang Zhang	Hsin-Jang Shieh
Pablo Fdez-Arroyabe	Vasile Zotic
Heimo Walter	Lucija Foglar
Mihaela-Carmen Muntean	Ahadollah Azami
Gheorghe Badea	Oprita Razvan
Bahar Razavi	Andrei Madalina-Teodora
Gabriel Badescu	Cristina Matos
Rodica Badescu	Tejinder Saggu
Dragoi Andreea	Mihaela Dudita
Karim Shirazi	Giri Kattel
Hui Wang	Sorin Gherghinescu
Lamyaa Taha	Ali Dashti Shafiei
Ismail Rakip Karas	Ahmet Ertek
Chirita Mioara	Cornelia Aida Bulucea
Walid Oueslati	Sara Sadrzadehrafiei
José Nunes	Suzana Yusup
Francisco Diniz	Feridoun Nahidi Azar
Calbureanu Popescu Madalina Xenia	Catarina Luísa Camarinhas
Oguz Arslan	Miguel Angel Vigil Berrocal
Arion Felix	Andreea Zamfir
Ioana Diaconescu	Thomas Panagopoulos
Khaled Galal Ahmed	Kaushal K. Srivastava
Sorin-Codrut Florut	Ana Maria Tavares Martins
Jose Manuel Mesa Fernández	Hamed Ziaeiipoor
Arash Barjasteh	Nabil Mohareb
Ioana Adrian	Diana-Elena Alexandru
Adrian Turek Rahoveanu	Mario Torcinaro
Krisztina Uzuneanu	Claudia A. F. Aiub
Al Emran Ismail	Saad Bakkali
Roman Mihai Daniel	Maria Bostenaru Dan
Davorin Kralj	Grabara Janusz
Jon Burley	Corina Carranca
Harry Coomar Shumsher Rughooputh	
Saeid Eslamian	

Table of Contents

Plenary Lecture 1: Energy and Environmental Landscape: The Laws of Thermodynamics and Nature	11
<i>M. Kostic</i>	
Plenary Lecture 2: Emphasis on Sustainability Concepts for Analyzing the Disconnection Process Energy Transformation in the Generator Circuit-Breaker	12
<i>Cornelia Aida Bulucea</i>	
Plenary Lecture 3: New Energy (Fuel) Will Save Our Earth - Dimethyl Ether (DME): A Clean Fuel for the 21st Century	13
<i>Kaoru Takeishi</i>	
Plenary Lecture 4: Formaldehyde Emission Modeling Depending on Plywood Thickness at Different Testing Temperatures	15
<i>Loredana Anne-Marie Badescu, Octavia Zeleniuc</i>	
Plenary Lecture 5: Incidence of Cutting Fluids on the Machining Process, the Operator and the Work Environment	16
<i>Constantin Buzatu</i>	
Plenary Lecture 6: Significance of Structural Health Monitoring in Cultural Heritage Structures	17
<i>Ahmet Turer</i>	
Plenary Lecture 7: Heavy Metal Contamination of Soils and Remediation Technologies	18
<i>Dilek Turer</i>	
Plenary Lecture 8: On the Link Between Energy Retrofit and Economic Evaluation Priorities	19
<i>Lamberto Tronchin</i>	
AC Micro-Power Plants Used in Offshore Drilling	21
<i>Ion Potârniche, Sorin Dan Grigorescu, Mina Gheamalinga, Mihai Octavian Popescu, Cornelia Popescu</i>	
Methods of Spatial Modeling for Evaluation of Air Quality Based on UAV	25
<i>Florin Mingireanu, Sorin Dan Grigorescu, Costin Cepisca, Catalin Stefan, Ionut Mocanu, Lucian P. Georgescu</i>	
Design and Implementation of Regional Balancing Mechanism Software	29
<i>Costin Cepisca, Sorin Dan Grigorescu, George Seritan, Cosmin Karl Banica</i>	
The Study of Head Losses for Land Drainage Pipes with and without Filtering Materials	33
<i>Hălbac-Cotoară-Zamfir Rares</i>	
Considerations on Unsteady-State Land Drainage for Soils with Humidity Excess	39
<i>Hălbac-Cotoară-Zamfir Rares, Circu Camelia</i>	

Addressing Some Sustainability Aspects of Electric Power Systems Comprising Generator Circuit-Breakers	43
<i>Cornelia A. Bulucea, Marc A. Rosen, Doru A. Nicola, Nikos E. Mastorakis, Carmen A. Bulucea</i>	
Satellite Image Processing and Mathematical Modeling of the Growth of Cyanobacteria to Determine the Level of Environmental Contamination in the Tiete River Beach	51
<i>Carlos E. Formigoni</i>	
Differences in Risk Assessment of Particular Areas of Interest	56
<i>Andrea Peterková, Michal Titko, Katarína Hollá</i>	
Vulnerability of Linear Transport Constructions of Critical Infrastructure and Comparison of Its Assessment Approaches	61
<i>Michal Titko, Andrea Peterková, Katarína Hollá</i>	
Renewable Electricity in Estonia – Discrepancy between State Subsidies and Private Demand	66
<i>Margot Roodi, Üllas Ehrlich</i>	
Estimation of Evapotranspiration from Measured Climatic Data	72
<i>Milan Hofreiter, Pavel Trnka</i>	
Extending the Contingent Valuation Method (CVM) to Assess Externalities Created Round a Cultural Heritage Preservation Site - A Knowledge Based Approach	76
<i>Fragiskos A. Batzias, Odysseas N. Kopsidas</i>	
Comparison of Economics of Renewable Generation in Estonian and Danish Electricity Market	82
<i>Izabella Knõš, Mart Landsberg, Juhan Valtin</i>	
Multi-Fuel Modeling of Oxygen Ion Transport in Solid Oxide Fuel Cell	89
<i>Tarkeshwar C. Patil, Shrikant G. Kulkarni, Siddhartha P. Duttagupta, Girish J. Phatak</i>	
Energy Performance and “Cost-Optimal Levels”: An Example	93
<i>Kristian Fabbri, Lamberto Tronchin, Valerio Tarabusi</i>	
Friction and Heat Transfer Characteristics of Silica and CNT Nanofluids in a Tube Flow	99
<i>Milivoje M. Kostic</i>	
Complementary Use of Solar Energy in Hybrid Systems Consisting of a Photovoltaic Power Plant and a Wind Power Plant	106
<i>Mustafa Music, Ajla Merzic, Elma Redzic, Damir Aganovic</i>	
Cost or Energy Efficiency? Criteria in Design of a Reinforced Concrete Structure of a Public Building	112
<i>Attila Puskas, Jacint Virag</i>	
Study on Shifting Performance of Electronically Controlled Continuously Variable Transmission (E-CVT)	118
<i>Kei-Lin Kuo, Cheng-Chi Yu</i>	

Wind Power Density Loss for Wind Turbines Due to Upstream Hills	123
<i>Bodo Ruck, Manuel Gruber</i>	
Effect of Platinum Electrode on Partial Oxidation of Glycerol and Optimization by Central Composite Design	129
<i>Juan Carlos Beltrán Prieto, Roman Slavík, Karel Kolomazník</i>	
Direct Synthesis of Dimethyl Ether from Carbon Dioxide over Copper Catalysts Prepared Using the Sol-Gel Method	134
<i>Kaoru Takeishi, Yutaro Wagatsuma</i>	
Incidence of Cutting Fluids on the Machining Process, the Operator and the Work Environment	137
<i>Constantin Buzatu, Badea Lepadatescu, Adriana Balacescu, Alexanru Orzan</i>	
Hydrogen Production from Dimethyl Ether and the Catalysts Development in the Case of the Sol-Gel Catalysts	142
<i>Kaoru Takeishi</i>	
Hydrogen Production from Dimethyl Ether and the Catalyst Preparation Methods	145
<i>Kaoru Takeishi</i>	
Forecasting Electricity Consumption Based on Smart Metering Case Study in Latvia	148
<i>Ilze Laicane, Andra Blumberga, Marika Rosa, Dagnija Blumberga, Uldis Bariss</i>	
Formaldehyde Emission Modeling Depending on Plywood Thickness at Different Testing Temperatures	156
<i>Badescu Loredana Anne-Marie, Zeleniuc Octavia, Urdea Simona</i>	
Degradation of Dyes Used in Textile Industries by Selected White-Rot Fungi	163
<i>Konstantina Papadopoulou, Fotis Rigas</i>	
First Results of an Airborne Release of Volcanic Ash for Testing of Volcanic Ash Plume Measurement Instruments	169
<i>K. Weber, C. Fischer, A. Vogel, T. Pohl, C. Böhlke, H. Lau, J. Eliasson, T. Palsson</i>	
Seismic Hazard Analysis (SHA) Considerations for South China Sea Territories of Malaysia	173
<i>Aziz Aulov, Mohd Shahir Liew</i>	
The Street - Playground or Dwelling for Some Children	179
<i>Cristina-Maria Povian, Halbac-Cotoara-Zamfir Rares</i>	
The Influence of the Nutrients Phosphorus and Nitrogen in the Amount of Chlorophyll a in the Waters of Esgotão Stream in the City of Sabino/SP- Brazil	185
<i>Ana Maria Taddei Cardoso, Clezi Conforto Zambon, Cássio L. F. De Oliveira, Paulo César Lodi</i>	
Environmental Impact of Building Retrofits	189
<i>Ligia Moga</i>	

Patterns of Foreign Direct Investments in the North East Romanian Region	195
<i>Aniela Raluca Danciu</i>	
Traffic Growth Rate and Composition of Dhaka-Chittagong Highway (N-1) of Bangladesh: The Actual Situation	201
<i>Mohammad Ahad Ullah, Md. Shamsul Hoque, Hamid Nikraz</i>	
Improvement of Fire Resistance Determination Process for Buildings and Metal Structures under the Influence of Fire	207
<i>Ana-Diana Ancas, Lucia-Maria Boeriu, Alexandru Serban, Cristian Nastac</i>	
Authors Index	210

Plenary Lecture 1

Energy and Environmental Landscape: The Laws of Thermodynamics and Nature



Professor M. Kostic
Department of Mechanical Engineering
Northern Illinois University
USA
E-mail: kostic@niu.edu

Abstract: Energy and Environmental landscape could be substantially enhanced with improved efficiency and diversification of energy sources, devices and processes. The fundamental Laws of Thermodynamics and comprehensive analysis and optimization are the most effective ways for the improvements and could lead to innovative development. The fundamental Laws of Nature are exceptionally simple but they appear in exceptionally many different forms, which explain universality and unity of simplicity and complexity, but also difficulties to recognize simplicity in complex diversity.

The philosophic axiom "causa aequat effectum" [the cause is adequate to the effect] traced to ancient philosophers, represents the most universal and fundamental law of nature, including existence and future, i.e. past and future transformations. Furthermore, the phenomenological Laws of Thermodynamics have much wider, including philosophical significance and implication, than their simple expressions based on the experimental observations – they are the Fundamental Laws of Nature. They are defining and unifying our comprehension of all existence in universe (all natural and man-made systems defined by their properties and processes) and all changes in time (all processes, including life), which are in turn caused by mass-energy transfer, from one system or subsystem to another, due to non-uniform mass-energy distribution in space and time.

Therefore, advances in energy conversion and utilization technologies and increase in efficiency, including computerized control and management, contribute to energy efficiency and conservation, increase in safety, and reduction of related environmental pollution. Actually, per capita energy use in the U.S. and other developed countries is being reduced in recent years. However, the increase of World's population and development of many underdeveloped and fast developing and very populated countries, like China, India and others, will influence continuous increase of the World energy consumption and related impact on the environment. After all, in the wake of a short history of fossil fuels' abundance and use (a blip on a human history radar screen), the life may be happier after the fossil fuel era!

Brief Biography of the Speaker: Milivoje M. Kostic, Ph.D., P.Eng., Professor of Mechanical Engineering at Northern Illinois University, is a notable researcher and scholar in energy fundamentals and applications, including nanotechnology, with emphasis on conservation, environment and sustainability. He graduated with the University of Belgrade highest distinction (the highest GPA in ME program history), obtained Ph.D. at University of Illinois at Chicago as a Fulbright scholar, appointed as NASA faculty fellow, and Fermi and Argonne National Laboratories faculty researcher. Professor Kostic also worked in industry and has authored a number of patents and professional publications, including invited articles in prestigious energy encyclopedias. He has a number of professional awards and recognitions, is a frequent plenary speaker at international conferences and at different educational and public institutions, as well as member of several professional societies and scientific advisory boards. More at www.kostic.niu.edu.

Plenary Lecture 2

Emphasis on Sustainability Concepts for Analyzing the Disconnection Process Energy Transformation in the Generator Circuit-Breaker



Associate Professor Cornelia Aida Bulucea

Faculty of Electrical Engineering

University of Craiova

ROMANIA

E-mail: abulucea@gmail.com

Abstract: The sustainability concepts of science describe aspects of the universe. A convincing example of the usefulness of exergy and embodied energy for analyzing systems which transform energy is the generator circuit-breaker (GCB) disconnection process. Nowadays, the electric connection circuits of power plants, based on fossil fuels as well as renewable sources, entail GCBs at the generator terminals, since the presence of that electric equipment offers many advantages related to the sustainability of a power plant. A generator circuit-breaker is located between the generator and the main step-up transformer, this location influencing the operating conditions of GCBs. The interruption requirements of a GCB are significantly higher than for the distribution network circuit-breakers. A generator circuit-breaker must be capable of interrupting not only the high symmetrical fault current, but also the higher asymmetrical faults currents resulting from high aperiodic pulsating components of the fault current. This way arises a sustainability requirement for generator circuit-breakers which are subjected to a unique demanding condition, called delayed current zeros. The manner in which the various factors influence the delay lasting of the first zero passing of the short-circuit current are investigated. Further in this study it is emphasized that although the phenomena produced in the electric arc at the terminals of the circuit-breaker are complicated and not completely explained, the concept of exergy is useful in understanding the physical phenomena. Investigations of electrics show that the limits between the microscopic and macroscopic phenomena are fragile and certain phenomena could be studied in related frames of work. The electric arc that occurs during the interruption processes in a circuit-breaker can be studied as a very high temperature (up to 50,000 K) continuous plasma discharge, and thermodynamic parameters must be taken into consideration; alternatively it could be seen as an electric conductor of a resistance depending on the current intensity (under a constant low voltage) and studied within the Faraday's macroscopic theory. Electric arc interruption is of great importance, because an uncontrolled electrical arc in the apparatus could become destructive since, once initiated, an arc will draw more and more current from a fixed voltage supply until the apparatus is destroyed. However, the appearance of an electric arc at the terminals of the circuit-breaker should not be necessarily seen as a damaging phenomenon since if the electric arc would not appear the network embedded magnetic energy would be converted to the energy of the circuit electric field, leading further to high over-voltages in the network. Moreover, due to the arc exergy, the aperiodic pulsating component of the short-circuit current decreases very quickly, starting with the moment of contact separation.

Brief Biography of the Speaker: Cornelia Aida Bulucea is currently an Associate Professor in Electrotechnics, Electrical Machines and Environmental Electric Equipment in the Faculty of Electrical Engineering, University of Craiova, Romania. She is graduate from the Faculty of Electrical Engineering Craiova and she received the Ph.D degree from Bucharest Polytechnic Institute. In Publishing House she is author of four books in electrical engineering area. Research work is focused on improved solutions for electrical networks on basis of new electric equipment, and environmental impact assessment of electric transportation systems. She has extensive experience in both experimental and theoretical research work, certified by over 70 journal and conference research papers and 15 research projects from industry. She has held in the Association for Environment Protection OLTENIA and she is a regular invited keynote lecture for environmental engineering symposia organized by Chamber of Industry and Commerce OLTENIA. Due to WSEAS recognition as huge scientific Forum she participated over time in nineteen WSEAS International Conferences, presenting papers and chairing sessions. She was Plenary Lecturer in the 5th IASME/WSEAS International Conference on ENERGY&ENVIRONMENT (EE'10), held by the University of Cambridge, UK, February 23-25, 2010, in the 4th IASME/WSEAS International Conference on ENERGY&ENVIRONMENT (EE'09), held by the University of Cambridge, Cambridge UK, February 24-26, 2009 and in the 8th WSEAS International Conference on POWER SYSTEMS (PS'08), held by the University of Cantabria, Santander, Spain, September 23-25, 2008. She is very proud by her over 30 papers published in the WSEAS Conferences Books and journals.

Plenary Lecture 3

New Energy (Fuel) Will Save Our Earth - Dimethyl Ether (DME): A Clean Fuel for the 21st Century



Associate Professor Kaoru Takeishi

Department of Materials Science and Chemical Engineering
Shizuoka University

Japan

E-mail: tcktake@ipc.shizuoka.ac.jp

Abstract: Dimethyl ether (DME) is the smallest ether, and its chemical formula is CH_3OCH_3 . DME usually exists as gas, but it is easy to liquefy by cooling at -25°C at atmospheric pressure and by pressurizing under 5 atm at room temperature. Therefore, DME is easy to handle like liquefied petroleum gas (LPG). DME will be used as fuel of substitute of LPG. In China, DME is mixed into LPG and used as a domestic fuel. Cetane number of DME is 55-60, so DME will be used as a diesel fuel. In Japan, China, Sweden and so on, DME buses and trucks are testing on public roads. DME does not contain poisonous substances, and it burns with no particulate matters (PM), no sulphur oxides (SOx), and less nitrogen oxides (NOx). Therefore, DME is expected as a clean fuel for the 21st century. DME is able to replace light oil and LPG, and its physical properties are similar to those of LPG. It is possible that DME infrastructures will be settled more rapidly than hydrogen, because existing LPG infrastructures can be used for DME. On the other hand, it is expected that fuel cell is one of the methods to restrain the global green effect. Steam reforming of methane, LPG, gasoline, and methanol is actively researched and developed as hydrogen supply methods for the fuel cells. Methanol steam reforming is easy to perform at around $250\text{-}300^\circ\text{C}$. However, the toxicity of methanol is high, and its infrastructure is not well developed. The infrastructures for natural gas, LPG, and gasoline are well established, but those steam reforming are difficult even at high temperatures around 800°C , and they contain sulphur resulting in catalyst poisoning. DME is expected as excellent hydrogen carrier and hydrogen storage, because DME will be easy to reform into hydrogen if there will be excellent catalysts of DME steam reforming. Therefore, I have been studying on DME steam reforming for hydrogen production, and researching on catalysts for DME steam reforming and DME synthesis.

The results of steam reforming of DME over several catalysts suggested the following facts: H_2 production with steam reforming of DME consists of two steps. The first step is hydrolysis of DME into methanol. The second step is steam reforming of methanol that produces H_2 and CO_2 . The rate determining step is hydrolysis of DME into methanol. The copper alumina catalysts prepared by the sol-gel method are excellent for H_2 production by steam reforming of DME. The reason is that $\gamma\text{-Al}_2\text{O}_3$ for the hydrolysis and Cu for methanol-steam reforming are co-existing closely on the catalyst surface. The consecutive reactions smoothly occur. Addition of Zn, Mn, or Fe into $\text{Cu}(30\text{wt.}\%)/\text{Al}_2\text{O}_3$ activates steam reforming of DME. The $\text{Cu-Zn}(29\text{-}1\text{wt.}\%)/\text{Al}_2\text{O}_3$ catalyst shows the excellent activity of DME steam reforming; the DME conversion is 95%, H_2 yield is 95%, and CO concentration was 0.8 mol.%. I have developed a new catalyst for H_2 production from DME, and the catalyst give us a great potential for H_2 supply from DME.

I have also developed catalysts for direct DME synthesis from syngas (mixture of hydrogen and carbon monoxide). The catalysts are prepared by the sol-gel method, and the surface of the catalysts is optimum for direct DME synthesis. Copper sites for methanol synthesis from syngas, $\gamma\text{-Al}_2\text{O}_3$ sites for dehydration of methanol into DME, and copper sites for water-gas shift reaction from H_2O & CO into H_2 & CO_2 , are co-existing closely on the catalyst surface. The consecutive reactions (methanol synthesis, methanol dehydration, and water-gas shift reaction) smoothly occur, and DME is produced fast. Therefore, these catalysts will be very effective for new energy society of DME and hydrogen.

Brief Biography of the Speaker:

Apr. 2009 - Present: Associate Professor (Lecturer), Faculty of Engineering, Shizuoka University
Oct. 1994 - Mar. 2009: Assistant Professor, Faculty of Engineering, Shizuoka University
Mar. 2005: Doctor of Engineering, Tokyo Institute of Technology
Apr. 1989 - Sep. 1994: Assistant Professor, Junior College of Engineering, Shizuoka University
Apr. 1987 - Mar. 1989: Researcher, Gotemba R&D Laboratory, Dow Chemical Japan

Apr. 1985 - Mar. 1987: Master Course of Electronic Chemistry, Tokyo Institute of Technology (Master of Science)

Apr. 1981 - Mar. 1985: Undergraduate Course of Chemistry, Science University of Tokyo (Bachelor of Science)

My main research field is catalysis chemistry. Now, I have specially been working for catalyst development for new fuels such as dimethyl ether (DME) and hydrogen.

Plenary Lecture 4

Formaldehyde Emission Modeling Depending on Plywood Thickness at Different Testing Temperatures



Professor Loredana Anne-Marie Badescu

Dr. Octavia Zeleniuc

Department of Wood Processing and Design of Wood Products
Faculty of Wood Engineering/Wood Machining
Center of Excellence (CCSPL)
Transilvania University of Brasov
ROMANIA

E-mails: loredana@unitbv.ro, zoctavia@unitbv.ro

Abstract: This paper presents a mathematical model for determining formaldehyde emission at plywood panels with different thickness, when the temperature is variation on the test condition. Modeling was performed based on the experimental results obtained at the determination of formaldehyde emission with the bottle method and results are a set of diagrams which can be appreciated the content and formaldehyde emission of plywood used in furniture construction.

Brief Biography of the Speaker:

Loredana Anne-Marie Badescu

-Professor dr eng at Transilvania University of Brasov, Romania, Wood Engineering Faculty

-33 years teaching experience in the field of Wood processing

-Wood Machining Center of Excellence founder (president from 2002 to present)

-Coordinated 5 successful national projects and acted as a collaborator in other 40 national and international research projects (LdV, CEEPUS, FP6, FP7)

-Coordinator in National Programme Researches PNII „Modelling to Sustainable Promotion of Wooden Products and Technologies with Impact on the Quality Environment.” The project aims to create and consolidate a package of procedures destined to reduce the entropic pressure over a basic component of the environment in the same time suggesting a model for eco-socio and economical sustainability. At present coordinator of two projects proposed in FP7 and ANR Bilateral programs Fr-Ro “Advancing knowledge on the assessment, verification, testing and modelling of noise, dust and VOC emissions from wood processing to promote a sustainable management of the wood chain”: and „Advanced knowledge, Modelling and Optimization on Structural wood components, of new ECO-products made with Welded WOOD dowels, with direct impact on environment in order to promote sustainable development”

- author of more than 150 papers published at national and international level, unique author for six books. And co-author in other 4 books.

Octavia Zeleniuc

Graduate of Wood Engineering Faculty, “TRANSILVANIA” University of Brasov, ROMANIA.

Senior research scientist grade II at National Institute of Wood Bucharest, between 1986 and 2004. In this institute, as head of laboratory, her work has been focused on wood drying and wood preservation. She received her Ph.D. in industrial engineering, in the field of beech timber drying, in 2000.

Since 2004, she has joined the Faculty of Wood Engineering having the competences in timber technology, wood treatments (drying and preservation) and wood testing: laboratory and field tests for wood durability evaluation, physical, mechanical properties, formaldehyde emissions from wood based products. She was Member in Management Committee COST E22 and COST E37 (2000-2008) and since 2010 she coordinates the activity of VOC & formaldehyde laboratory at RTD Research Institute Brasov.

Author and co-author in over 70 scientific articles published in Journals and in the Proceedings of National and International Conferences: Romania, Canada, Greece, France, Portugal, Slovenia, Slovakia, UK, etc. Papers presented in some WSEAS Conferences in Brasov (2009), Tenerife (2009), Malta (2010) and Angers (2011).

Plenary Lecture 5

Incidence of Cutting Fluids on the Machining Process, the Operator and the Work Environment



Professor Constantin Buzatu

Faculty of Technological Engineering
Manufacturing Technology Department

Transilvania University of Brasov

Romania

E-mail: cobuzatu@unitbv.ro

Abstract: Currently over 60% of manufacturing processes of various metal parts are made by cutting using various methods, in the presence of cutting fluids transmitted in the work area from central station. With all the advantages on quality shows they obtained, unless management is done properly, cutting fluids can cause some disadvantages of the process, but also negative effects on environment and health security operator. The paper analyzes positive and negative effects of using cutting fluids on the process, the operator and the environment based on research done by the authors.

Brief Biography of the Speaker: Constantin Buzatu is Professor at the Faculty of Technological Engineering and Manufacturing Technology Department of Transilvania University of Brasov, Romania. He graduated in 1972 and he obtained his Ph.D. in the field of accuracy of machining processes. His research interests are in Manufacturing engineering processes, Automation in industry, Performance measurement and management, Education technology. He is author and co-author of seven books and more than 150 papers in national and international conferences. Also he has been research manager for several research grants from Ministry of Education of Romania, and for contracts with factories in industry to introduce new technologies in producing workpieces and to improve their reliability. He was member of technical program committee of some conferences and chairman of local and international conferences. He has been scientific reviewer for International Conferences and independent evaluator for Grant National Competitions.

Plenary Lecture 6

Significance of Structural Health Monitoring in Cultural Heritage Structures



Associate Professor Ahmet Turer
Structural Mechanics Laboratory
Civil Engineering Department
Middle East Technical University
Turkey
E-mail: aturer@metu.edu.tr

Abstract: Monitoring of modern and special civil engineering structures, extraordinary ones such as long span bridges, high rise buildings, deep tunnels, are under continuous control by measurement devices; which is commonly referred as Structural Health Monitoring (SHM). The main concept behind SHM is to place necessary amount of gages at critical locations in a structure to evaluate its status in time and even generate warning signals in the form of audible alarms or SMS messages if measurements exceed predefined damage limits; which is commonly defined as smart structures. This technology has also been implemented on cultural heritage structures since they are irreplaceably valuable and very important structures. This lecture gives a brief background on SHM and application of monitoring techniques on cultural heritage structures while putting emphasis on commonly used sensors and datalogger types. Interesting monitoring examples will be provided showing detectable structural changes on historic structures that undergo restoration work and could have been otherwise lead to undesirable effects if monitoring was not performed. Other monitoring types of short monitoring for dynamic testing will be discussed and relevance to finite element model calibration will be discussed.

Brief Biography of the Speaker: Dr Ahmet Turer received his B.S. (High Honor, 1993) in Civil Engineering from Middle East Technical University (METU) in Ankara, then M.S. (1997) and PhD (2000) degrees from University of Cincinnati (UC), Ohio-USA. He worked as a structural engineer and project planner between 1993-1995 in Turkey as well as research assistant and part-time structural engineer in USA. Assoc. Prof. Dr. Ahmet Turer has been a full time faculty member at METU Civil engineering department since 2000 and specialized on structural analysis, monitoring, condition evaluation of historic structures and bridges. He is the author of close to 100 conference and international peer reviewed journal papers. He received science award from Istanbul Kultur University in 2007 for his innovative work on developing strengthening techniques using scrap tires for non-engineered masonry rural houses self-constructed by poor occupants. He serves as the head of Special and Tall Structures Research Center at METU.

Plenary Lecture 7

Heavy Metal Contamination of Soils and Remediation Technologies



Associate Professor Dilek Turer
Department of Geological Engineering
Hacettepe University
Turkey
E-mail: dturer@hacettepe.edu.tr

Abstract: Soils can contain heavy metals naturally because of their metal rich source rock but the main reason for the high concentrations observed in soils is the anthropogenic sources. These sources are mine tailing, usage of leaded gasoline and paints, pesticides, fertilizers, and industrial wastes. The most commonly found heavy metals in contaminated sites are lead, zinc, copper, chromium, nickel, and mercury. Contaminated soils can result in some health problems in humans through breathing of contaminated soils as small dust particles in the air when they are disturbed and also through food chain and contaminated groundwater. Besides isolation of the contaminated soils as a method to prevent the mobility of the heavy metals there are many other techniques that are either trying to remove or fix the heavy metals in the soils, described in the literature. In this lecture, basics of these techniques (immobilization by solidification/stabilization, extraction by soil washing and electrokinetic treatment and others) and the results of the laboratory work on solidification and electrokinetic treatment carried by the speaker will be presented.

Brief Biography of the Speaker: Assoc. Prof. Dr D. Turer holds a bachelor degree in Geological Engineering from Middle East Technical University (TURKEY), MSc and PhD in Geology (2000) from the University of Cincinnati (USA). She has been a faculty member of Geological Engineering Department of Hacettepe University (TURKEY) since 2001. Her research interests include heavy metal contamination of soils, stabilization/solidification technologies, and environmental geology. She has 10 publications in highly rated ISI journals and 17 in conference proceedings.

Plenary Lecture 8

On the Link Between Energy Retrofit and Economic Evaluation Priorities



Professor Lamberto Tronchin

DIENCA - CIARM

University of Bologna

Italy

E-mail: Lamberto.tronchin@unibo.it

Abstract: The financial crisis of 2008 (and following) caused mainly the construction and real estate sectors to suffer. Moreover, the buildings are responsible of about 40% of incidence on energy emission. The economic crisis did not allow realizing new buildings, and the existing buildings have too much greenhouse emission, that needs to be reduced.

The Energy Retrofit actions could be a way to improve both sectors, because it reduces emission and real estate sector. But Energy Retrofit has some difficulties when it is used to evaluate a better energy, economic and technical solution.

In this paper we present an energy retrofit calculation about an Italian case study: one building typology that is supposed realized in several different periods, with different thermo-physic parameters. For each period it will be applied 4 energy retrofit actions, also will be calculated energy performance of the building, energy cost and economic Simple Pay Back Period (SPB). The aims of paper are to detect whether exists a linear relationship between energy saving increase and SPB decrease for each specific technology, for each different period.

Brief Biography of the Speaker: Dr Lamberto Tronchin is Associate Professor in Environmental Physics from the University of Bologna and is recognised internationally as a leading authority on the subject of sound and acoustics. A pianist himself, with a diploma in piano from the Conservatory of Reggio Emilia, Dr Tronchin's principal area of research has been musical acoustics, room acoustics and signal processing. He is the author of more than 160 papers and was Chair of the Musical Acoustics Group of the Italian Association of Acoustics from 2000 to 2008. Dr Tronchin is a member of the Scientific Committee of the CIARM, the Inter- University Centre of Acoustics and Musical research, has chaired sessions of architectural and musical acoustics during several international symposiums, been a referee for a number of International journals and is Chair of Organising and Scientific Committees of IACMA (International Advanced Course on Musical Acoustics).

He was a visiting researcher at the University of Kobe in Japan, a visiting professor at the University of Graz in Austria and Special honored International Guest at the International Workshop, 'Analysis, Synthesis and Perception of Music Signals', at Jadavpur University of Kolkata, India in 2005. He has chaired the International Advanced Course on Musical Acoustics (IACMA), organised with the European Association of Acoustics, which was held in Bologna, in 2005. In 2008 and 2009 he gave plenary lectures at International Congresses on Acoustics in Vancouver, Prague, Bucharest, Santander, Kos, Malta and Paris. He designed theatres and other buildings, as acoustic consultant, in collaboration with several Architects, among them Richard Meier and Paolo Portoghesi.

Authors Index

Aganovic, D.	106	Hofreiter, M.	72	Popescu, M. O.	21
Ancas, A.-D.	207	Hollá, K.	56, 61	Potârniche, I.	21
Aulov, A.	173	Hoque, M. S.	201	Povian, C.-M.	179
Badescu, A.-M. L.	156	Knöš, I.	82	Puskas, A.	112
Balacescu, A.	137	Kolomazník, K.	129	Rares, H.-C.-Z.	33, 39, 179
Banica, C. K.	29	Kopsidas, O. N.	76	Redzic, E.	106
Bariss, U.	148	Kostic, M. M.	99	Rigas, F.	163
Batzias, F. A.	76	Kulkarni, S. G.	89	Roodi, M.	66
Beltrán Prieto, J. C.	129	Kuo, K.-L.	118	Rosa, M.	148
Blumberga, A.	148	Laicane, I.	148	Rosen, M. A.	43
Blumberga, D.	148	Landsberg, M.	82	Ruck, B.	123
Boeriu, L.-M.	207	Lau, H.	169	Serban, A.	207
Böhlke, C.	169	Lepadatescu, B.	137	Seritan, G.	29
Bulucea, Ca. A.	43	Liew, M. S.	173	Simona, U.	156
Bulucea, Co. A.	43	Lodi, P. C.	185	Slavík, R.	129
Buzatu, C.	137	Mastorakis, N. E.	43	Taddei Cardoso, A. M.	185
Catalin, S.	25	Merzic, A.	106	Takeishi, K.	134, 142, 145
Cepisca, C.	25, 29	Mingireanu, F.	25	Tarabusi, V.	93
Circu, C.	39	Mocanu, I.	25	Titko, M.	56, 61
Danciu, A. R.	195	Moga, L.	189	Trnka, P.	72
De Oliveira, C. L. F.	185	Music, M.	106	Tronchin, L.	93
Doru, A. N.	43	Nastac, C.	207	Ullah, M. A.	201
Duttgupta, S. P.	89	Nikraz, H.	201	Valtin, J.	82
Ehrlich, U.	66	Orzan, A.	137	Virag, J.	112
Eliasson, J.	169	Palsson, T.	169	Vogel, C. F. A.	169
Fabbri, K.	93	Papadopoulou, K.	163	Wagatsuma, Y.	134
Formigoni, C. E.	51	Patil, T. C.	89	Weber, K.	169
Georgescu, L. P.	25	Peterková, A.	56, 61	Yu, C.-C.	118
Gheamalinga, M.	21	Phatak, G. J.	89	Zambon, C. C.	185
Grigorescu, S. D.	21, 25, 29	Pohl, T.	169	Zeleniuc, O.	156
Gruber, M.	123	Popescu, C.	21		