

P O L S K A A K A D E M I A N A U K

I N S T Y T U T M A S Z Y N P R Z E P Ł Y W O W Y C H

**TRANSACTIONS
OF THE INSTITUTE OF
FLUID-FLOW MACHINERY**

PRACE

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**Selected papers from the First Polish-Japanese
Hakone Group Symposium on Nonthermal Plasma
Processing of Water and Air, Sopot, Poland,
May 29-31, 2000**



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THE TRANSACTIONS OF THE INSTITUTE OF FLUID-FLOW MACHINERY

exist for the publication of theoretical and experimental investigations of all aspects of the mechanics and thermodynamics of fluid-flow with special reference to fluid-flow machines

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PRACE INSTYTUTU MASZYN PRZEPŁYWOWYCH

poświęcone są publikacjom naukowym z zakresu teorii i badań doświadczalnych w dziedzinie mechaniki i termodynamiki przepływów, ze szczególnym uwzględnieniem problematyki maszyn przepływowych

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Preface

This Special Issue of the Transactions of the Institute of Fluid-Flow Machinery of Polish Academy of Sciences contains selected papers from the First Polish-Japanese Hakone Group Symposium on Nonthermal Plasma Processing of Water and Air held in Sopot, Poland on May 29-31. The First Polish-Japanese Hakone Group Symposium formalised a long series of informal meetings of Polish and Japanese scientists, who had already had opportunity to meet during variable occasions like International Symposiums on High Pressure Low Temperature Plasma Chemistry, originated in Hakone (Japan) in 1987 and continued in Lublin (Poland), 1989, Strasbourg (France), 1991, Bratislava (Slovakia), 1993, Milovy (Czech Republic), 1996 and Cork (Ireland) in 1998. These symposiums were attended by scientists and engineers from all over the world, who specialise in plasma processing of water and air. This year Japanese and Polish scientists working on the above subjects have met in Sopot. In view of the importance of this event, this Special Issue is printed here as a milestone for the future Polish-Japanese as well as international cooperation in these subjects.

The Honorary Committee for the First Polish-Japanese Hakone Group Symposium was set up by Prof. K. Asano, President of the Institute of Electrostatics in Japan, Prof. J. Mikieliewicz, Director of the Institute of Fluid-Flow Machinery, Gdańsk and Prof. I. Pollo, Chairman of the PASci Plasma Chemistry Committee. The co-chairmen of the Symposium were Prof. J. Mizeraczyk from the Institute of Fluid-Flow Machinery, Gdańsk and Prof. Chobei Yamabe from Saga University, Saga, Japan. Dr M. Dors was the Symposium Secretary and Organising Committee was established by Mr M. Jasiński, MSc, Mr M. Kocik, MSc, Mr A. Dąbrowski, MSc, Mr P. Szczucki, MSc, Mr T. Kasperkowicz, MSc and Mr J. Podliński.

More than 30 scientists from Poland and abroad were present at the Symposium, a half of the total number of participants were scientists from Japan. Apart from Prof. K. Asano already mentioned, there were present also: Prof. T. Sakai, Musashi Institute of Technology, Tokyo, Prof. S. Okazaki, Sophia University, Tokyo, Prof. T. Oda, University of Tokyo, M. Sato, Gunma University, Prof. A. Mizuno, Toyohashi University of Technology and Prof. T. Ohkubo, Oita University. Poland was represented by afore-mentioned, Prof. I. Pollo and Prof. J. Mizeraczyk, and other Professors: Prof. A. G. Chmielewski from the Institute of Nuclear Chemistry and Technology, Warsaw, Prof. T. Janowski from Lublin Technical University, Prof. A. Huczko from the University of Warsaw, Prof. K. Schmidt-Szałowski from Warsaw Technical University and Dr J. Polaczek from the Industrial Chemistry Research Institute, Warsaw. Other members of the Hakone Group from European countries also took part in the Symposium: Prof. M. Rea from Italy, (University of Padova), Prof. H.-E. Wagner, (University of Greifswald, Germany). Moreover, there appeared Prof. J.-S. Chang and Dr K. Urashima from Canada (McMaster University, Hamilton, Canada).

The Symposium was also attended by the representatives of industrial branches (e.g.

Thermal Electric Power Station "Wybrzeże", Gdańsk, Gdańsk Enterprise of Thermal Energy) and scientific foundations (Science-Technology Foundation "Gdańsk").

There were 27 papers presented. These papers covered various subjects of the pollution control related to nonthermal plasma technology, including: (1) air and gaseous pollution controls (NO_x , SO_2 , volatile organic compounds (VOCs), ozone depletion substances (ODSs), particulate matter (PM) etc.), (2) plasma reforming of hydrocarbon and solid waste, (3) novel measurement technologies and power supply development, (4) advanced ozonizers and the direct plasma water treatments, and (5) solid surface treatments. We believe that these papers will be of special interest to the readership of this journal.

Symposium was concluded with the Panel Session on the future of plasma processing of water and air for the environment protection. The members of the Panel were Professors J.-S. Chang, A. Mizuno, K. Schmidt-Szałowski, T. Oda, C. Yamabe, T. Ohkubo and J. Mizeraczyk. The following subjects were discussed: (1) areas of the efficient application of various nonthermal plasma devices such as electron beam, barrier discharge, pulsed corona, flow stabilized corona etc., (2) synergetic effect of nonthermal plasma and catalysts for pollution control and reforming of hydrocarbons, and (3) high concentration ozonizer developments.

The splendour was added to the Symposium by a ceremonious opening, where Prof. J. Mikielewicz, Director of the Institute of Fluid-Flow Machinery awarded the medal of the Institute to Prof. J.-S. Chang, McMaster University, Canada, for a long standing support and promotion of the Institute on the international arena. Moreover, the Institute of Fluid-Flow Machinery medals were given to Prof. T. Sakai from Musashi Institute of Technology, Tokyo, Prof. S. Okazaki from Sophia University, Tokyo and Prof. I. Pollo from Lublin Technical University to honour their most indebted scientific activities aimed at the development of nonthermal plasma processing of water and air for environment protection. The Mayor of the City of Gdańsk, Mr. P. Adamowicz, to commemorate the visit of distinguished guests from Japan awarded them medals issued on the occasion of the tenth anniversary of Gdańsk self-government. Presentation ceremony was held in the Red Chamber of the Main Town Hall in Gdask.

Wishes and congratulatory letters to the Symposium were also sent by the Chairman of the State Committee for Scientific Research (KBN), Minister of Science, Prof. A. Wiszniewski, Attaché of the Japanese Embassy in Poland, Mr. M. Ito, President of the Polish-Japanese Society, Mrs. H. Pacwa and President of the Regional Fund for Environmental Protection and Water Management in Gdańsk, Mrs. D. Grodzicka-Kozak.

The Symposium was supported and financially assisted by the Polish State Committee for Scientific Research (KBN), Polish Academy of Sciences (PASci), Japanese Society for the Promotion of Science (JSPS), Institute of Fluid-Flow Machinery of the Polish Academy of Sciences, Regional Fund for Environmental Protection and Water Management in Gdańsk, Sopot Municipal Authorities, Environmental Protection Bank (Bank Ochrony Środowiska-Gdańsk), Thermal-Electric Power Station "Wybrzeże" and the Amber Brewery Bielkowo.

The Guest Editors are very grateful to the referees of the papers presented in this issue: A.A. Berezin, D. Brocilo, H. Itoh, S. Kanazawa, Y. Kawada, B. Locke, A. Mizuno, T. Oda, T. Ohkubo, G. Round, K. Urashima, C. Yamabe, and T. Yamamoto.

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