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## Preface

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**Biographical notes:** Toshiaki Yamamoto received his PhD in Mechanical Engineering Department from Ohio State University. He is currently a Professor of Electrical and Electronics Engineering at Musashi Institute of Technology after his retirement from the Department of Mechanical Engineering at Osaka Prefecture University in 2007. His research interests are the application of nonthermal plasma for environmental control, indoor air quality, electrohydrodynamics and micro-contamination control research. He is a fellow of the *International Society for Electrostatic Precipitation*, Regional Editors and Board members of the *International Journal of Environment and Waste Management* and the Institute of Electrostatics Japan, and served as IEEE-IAS EPC Chairman and international conferences.

Akira Mizuno received the BS from Nagoya University, Nagoya, Japan, and the MS and PhD from The University of Tokyo, Japan, in 1973, 1975 and 1978, respectively, all in Electrical Engineering. He was with Ishikawajima-Harima Heavy Industries, 1978–1981. Since 1981 he has been with Toyohashi University of Technology, Japan, where he is a Professor of Ecological Engineering. His research field is on applied electrostatics and high-voltage engineering. He was a visiting research fellow in the Department of Physics, Florida State University, 1982 to 1984 in a project involving electron beam charging and precipitation of aerosols and industrial dusts.

S. Futamura received his PhD in Organic Chemistry from the University of Tokyo in 1982. He is currently Director for Industrial Science and Technology

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Acid rain, global warming, ozone depletion, photochemical smog, and water pollution are pre-eminent environmental problems facing the world today. Nonthermal plasma technologies not only offer an innovative approach to the solution for environmental protection but also give a potential for other industrial applications. The nonthermal plasma technology has grown dramatically in the last 25 years but it seems that very few people have recognised it to provide a wide range of industrial applications and high potential for economical processes, such as flue gas treatment, ozoniser, odour control, surface modification for polymers, glasses and metals, sterilisation, surface cleaning, heat transfer enhancement, fuel synthesis, new materials, carbon nanotubes, diamond synthesis, medical area, etc.

As one of the inaugural issue of the *International Environment and Water Management (IJEWM)*, we focus on environmental applications using nonthermal plasma technology. This special issue contains a wide range of hazardous air pollutants treatment such as suspended particulates (PM), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), chlorofluorocarbons (CFCs) by means of various types of nonthermal plasma. There are many types of nonthermal plasma devices that have been developed for environmental applications, although we cannot cover everything in this special issue.

Nonthermal plasmas are plasmas in which the electrons mean that the energies are considerably higher than those of the compounds of the ambient gas. The majority of the electrical energy goes into the production of energetic electrons, rather than into gas heating, so that the plasma can be achieved at nearly ambient temperature and pressure. The energy in the plasma is thus directed preferentially to the electron-impact dissociation and ionisation of the background gas to produce radicals that in turn decompose the toxic molecules. However, recent technology indicated that plasma device alone cannot solve many problems but quite often requires the plasma device combined with catalysts/chemical/adsorption processes to remove undesired plasma reaction by-products for successful environmental control.

Finally, I appreciate all authors contributing to this special issue for environmental applications of nonthermal plasma and it is hoped that this special issue will serve as a guide for further developments in the engineering and industrial applications of pollution control devices using nonthermal plasmas. We encourage you to consider the submission of your paper for IJEWM.

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