PROCEEDINGS OF SPIE

International Conference on Optical Particle Characterization (OPC 2014)

Nobuhiro Aya
Norihiko Iki
Tsutomu Shimura
Tomohiro Shirai
Editors

10–14 March 2014
Tokyo, Japan

Hosted by
National Institute of Advanced Industrial Science and Technology (AIST) (Japan)

Published by
SPIE

Volume 9232

Proceedings of SPIE 0277-786-786X, V.9232

International Conference on Optical Particle Characterization (OPC 2014), edited by Nobuhiro Aya, Norihiko Iki, Tsutomu Shimura, Tomohiro Shirai, Proc. of SPIE Vol. 9232, 923201 · © 2014 SPIE
CCC code: 0277-786X/14/$18 · doi: 10.1117/12.2077312

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Please use the following format to cite material from this book:
Author(s), "Title of Paper," in *International Conference on Optical Particle Characterization (OPC 2014)*, edited by Nobuhiro Aya, Norihiko Iki, Tsutomu Shimura, Tomohiro Shirai, Proceedings of SPIE Vol. 9232 (SPIE, Bellingham, WA, 2014) Article CID Number.

ISSN: 0277-786X
ISBN: 9781628412864

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

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Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

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Introduction

There are continuing and growing needs for techniques to determine the behaviors and characteristics of particles and the developments of nano-materials in science, engineering, medicine, human-environment, and leading industries. Optical methods are the most powerful tools, and they are capable of rapid on-line and in-situ measurement of various sizes of particles and their behaviors from molecular clusters to raindrops.

The International Conference on Optical Particle Characterization (OPC 2014) was held 10–14 March 2014 at the AIST Tokyo Waterfront, Tokyo, Japan, in order to discuss not only the optical measurement of particle concentration, size, shape, structure, and composition in various phases, but also the optical handling of particulate matter with the traditional and novel methods. It was the 10th international scientific conference which aims to contribute to development of the whole science and technology on the particle characterization with light, succeeding the basic principle of the previous successful series of conferences on OPC (and OPS = Optical Particle Sizing—the former name of the conference series) since 1987.

Forty-six oral presentations were accepted and made in 15 sessions at OPC 2014. Five invited lectures were given by the following leading scientists who were recommended by the international advisory committee and the program committee of OPC2014, viz., Dr. W. Bachalo, Atrium Technologies Inc. (United States), Prof. F. Scheffold, University of Fribourg (Switzerland), Prof. M. Shibayama, The University of Tokyo (Japan), Prof. P. Wagner, University of Vienna (Austria), and Prof. Y. Zhang, Shanghai Jiao Tong University (China). Also, Dr. D. Koltsov, BREC Solutions Ltd. (United Kingdom), gave a special lecture titled "Nanomaterials and fine bubbles standardisation and regulation" at the joint workshop of OPC2014, AIST, and FBIA (Fine Bubble Industry Association) held on the opening day of OPC2014.

Very fruitful discussions were made at OPC 2014. The conference program covered theoretical and experimental works, pertaining to the fundamentals of optical particle sizing and characterization, as well as its scientific, technological, and industrial applications.

In this proceeding volume, 36 original papers are published from among the studies presented at OPC 2014 after a post-conference peer reviewing process

coordinated by the scientists on each field including the chairs of the sessions and the committee members. Two of the invited papers are also included.

Nobuhiro Aya