Proceedings of the 4th International Symposium on Materials and Sustainable Development

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Editors

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Volume 1: Nano Technology and Advanced Materials

Springer

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ISBN 978-3-030-43267-6 ISBN 978-3-030-43268-3 (eBook)
https://doi.org/10.1007/978-3-030-43268-3

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

As part of the scientific events which took place within the M'Hamed Bougara University of Boumerdes, the Research Unit: Materials, Processes and Environment of the Faculty of Technology, organizes, from 12 to 14 November 2019, the 4th international conference on materials and sustainable development (4th ISMSD 2019).

This scientific, technological and environmental gathering will strive to improve by trying:

1. To deepen the subject relating to nanomaterials and their incorporation in other materials.
2. Take an interest in sustainable development by focusing on renewable energies, recycling and recovery of materials, the quality of which will contribute to improving environmental protection.
3. To deepen the university–industry complementarity by multiplying the contacts between them in order to possibly bring solutions to the problems hampering the technological processes.
4. To energize the partnership, collaboration and development of relations between our university and certain foreign universities by working on joint projects to allow, among other things, our doctoral students to benefit from joint supervision and to facilitate exchanges between our students and foreign students.
5. Foster links between national researchers who will take note of the work presented by dissecting it to draw inspiration from it, as far as possible.
6. Choose the best work by rewarding the winners.

To this end, this symposium will focus on:

Theme 1: Nanomaterials, Nanotechnology and Emerging Intelligent Materials
Theme 2: Cementitious Materials and Material Properties
Theme 3: Renewable Energies, Sustainable Development, Recycling and Environment
Theme 4: Materials, Processes and Transformations

We would like to express our gratitude and appreciation for all of the reviewers who helped us maintain the high quality of manuscripts included in the proceedings published by Springer Nature. We would also like to extend our thanks to the members of the organizing team for their hard work. It is hoped that this volume will be of help to many researchers working in diverse topics present in the ISMSD2019.

It is a great privilege for us to present the proceedings of ISMSD2019 to the authors and delegates of the event. We hope that you will find it useful, exciting and inspiring.

Abdelbaki Benmounah
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Objectives of the Fourth International Symposium on Materials and Sustainable Development

This book presents the proceedings of the 4th International Symposium on Materials and Sustainable Development ISMSD2019 (CIMDD2019) that was held during 3-day (12–14 November) and organized by the Research Unit: Materials, Processes and Environment and M'hamed Bougara University of Boumerdes (Algeria) in partnership with University of Reims - Champagne-Ardenne (France). This symposium follows the success of CIMDD 2013–2015–2017 and continues the traditions of the highly successful series of International Conferences on the Materials, Processes and Environment. The symposium will provide a unique topical forum to share the latest results of the materials and sustainable development research in Algeria and worldwide.

Organization

Research Unit: Materials, Processes and Environment and M'hamed Bougara University of Boumerdes, in partnership with and University of Reims Champagne-Ardennes

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Contents