

Preface

The global challenges, as defined by the OECD, provide multiple requirements for all type of materials. One of the major goals of the World Materials Research Institute Forum (WMRIF) is to make young scientists aware of the materials challenges associated with the grand societal needs, like climate change, health, energy, mobility, security. The promotion of the WMRIF global ideas and knowledge exchange among young researchers represents a major accelerator to push future research and development into that direction, but also to provide a common understanding among the following researcher generation about current and future needs in materials science and engineering all over the globe. In the previous WMRIF Young Scientist Workshops already some material requirements to meet global challenges like water supply and scarce elements have been addressed. Following to the workshops in 2008 and 2010 in Tsukuba and Berlin, respectively, the 3rd WMRIF Young Materials Scientist Workshop was organized by MTEC in Thailand. During August 28th to 31st, 2012 29 young scientists from 17 institutes in 12 countries presented their work in Bangkok, Thailand, matching increasingly important subjects under the topics:

- Reliable manufacturing with advanced materials
- Materials challenges for biomedical applications
- Materials challenges in mitigation and adaption to climate change

The workshop not only found a tremendous echo among the young and senior audience from the member institutes, but also among additional scientists and governmental staff from Thailand, representing one of the highly industrialized and productive countries in the eastern hemisphere. In continuation of the previous successes, the best five presenters were awarded a two week stay at a WMRIF institute of their choice.

The present book compiles the peer reviewed and revised papers presented during this 3rd WMRIF Young Materials Scientist Workshop. The reader will find very valuable contributions to the above mentioned topics, representing in most cases cutting edge research.

In the name of all WMRIF member institutes and, in particular, in the name of the Working Group 3 members, the editors convey their sincere gratitude to all authors and to all participants at the workshop for their individual contributions, for their eager discussions and, in particular, for pushing the scientific knowledge in the four subjects further on.

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Materials Challenges and Testing for Manufacturing,
Mobility, Biomedical Applications and Climate
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Lexow, J. (Eds.)
2014, X, 245 p. 120 illus., 67 illus. in color., Hardcover
ISBN: 978-3-319-11339-5