MCR 2009
# Contents

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Catalysis and Multi-Component Reactions</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Multi-Component Reactions in Heterocyclic Chemistry</td>
<td>31</td>
</tr>
<tr>
<td>3</td>
<td>Multi-Component Reactions in Drug Discovery</td>
<td>75</td>
</tr>
<tr>
<td>4</td>
<td>Novel Reagents for Multi-Component Reactions</td>
<td>107</td>
</tr>
<tr>
<td>5</td>
<td>Design of Multi-Component Reactions</td>
<td>139</td>
</tr>
<tr>
<td>6</td>
<td>Multi-Component Reactions in Supramolecular Chemistry and Material Science</td>
<td>173</td>
</tr>
<tr>
<td></td>
<td>Conference Program</td>
<td>203</td>
</tr>
<tr>
<td></td>
<td>List of Participants</td>
<td>207</td>
</tr>
<tr>
<td></td>
<td>Index</td>
<td>221</td>
</tr>
</tbody>
</table>
Introduction to the Proceedings of the Fourth International Conference on Multi-Component Reactions and Related Chemistry

Maxim A. Mironov

The Fourth International Conference on Multi-Component Reactions and Related Chemistry was held in Ekaterinburg, Russia, from May 24 to 28, 2009. The conference evolved from a great tradition that was started by Prof. Ivar Ugi, who can be considered the father of the concept of Multi-Component Reactions (MCRs) and the grandfather of combinatorial chemistry. This meeting was a continuation of three highly successful conferences on the same topic that were held in Munich in 2000, in Genova in 2003, and in Amsterdam in 2006. All of the conferences had about 250 participants, about half of them coming from private companies. The quality and variety of the presented lectures greatly contributed to this outcome. Due to its unique geographical position on the border of Europe and Asia, Ekaterinburg assumes the role of an important center of cooperation between the East and the West. This place was ideal for the Fourth International Conference on Multi-Component Reactions and Related Chemistry, chaired by Prof. Oleg Chupakhin and Dr. Maxim Mironov, where 134 scientists from 17 countries covering Europe, North America, South Asia, and the Pacific regions discussed recent progress and further developments in the field. A total of 43 oral presentations and 52 posters were delivered. Our event was supported by two leader companies in pharma research: ChemDiv Inc. and Abbott Laboratories, and also by the Russian Academy of Science and Springer Science+Business Media. Materials of the conference were published in a special issue of Molecular Diversity (Springer). The conference was accompanied by an exhibition and training courses, which featured participation from the pharma industry, analytical equipment providers, and publishers.

The scientific program of the conference focused on MCRs, which are a rapidly expanding research area in medicinal chemistry and materials science. The classical MCR chemistry is well-known to those who have studied organic chemistry at the university level. Many of these classical reactions are named reactions, such as the Mannich reaction and its intramolecular variant, the Pictet–Spengler reaction, the Strecker synthesis, the Ugi four-component condensation, and many others. Nowadays, the number of research groups active in the MCR field is growing.

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rapidly and novel MCRs are being discovered or developed on a weekly basis. The number of publications in the MCR area has increased dramatically, reaching several hundred articles per year. More and more companies continue to adopt this chemistry in their synthetic repertoire. There are several advantages of synthesis using MCRs. First, they are fully amenable to automated synthesis because there is no need to isolate any intermediates and the experiments are carried out in a single reaction vessel. Second, MCRs are more convergent than synthesis pathways based on a sequence of uni- and bimolecular reactions. In addition, MCRs are a particular case of reaction networks, which can be considered a model of natural processes and prebiotic evolution. Although the main focus of the conference was on MCRs, its scope embraced organic synthesis via tandem or cascade reactions, combinatorial approaches to new materials, catalysts, and supramolecular structures. The conference was organized in six sections: (1) Catalysis and Multi-Component Reactions; (2) Multi-Component Reactions in Heterocyclic Chemistry; (3) Multi-Component Reactions in Drug Discovery; (4) Novel Reagents for Multi-Component Reactions; (5) Design of Multi-Component Reactions; and (6) Multi-Component Reactions in Supramolecular Chemistry and Material Science.
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