Green Metathesis Chemistry
NATO Science for Peace and Security Series

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Series A: Chemistry and Biology
Green Metathesis Chemistry

Great Challenges in Synthesis, Catalysis and Nanotechnology

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Preface

Green Metathesis Chemistry: Great Challenges in Synthesis, Catalysis and Nanotechnology

For the last 2 decades NATO ASI meetings on Metathesis Chemistry have acted as promoters of excellence in research on and valorization of this fascinating scientific area. Five such events organized previously (Akçay, Turkey, 1989, 1995; Polanica-Zdrój, Poland, 2000; Antalya, Turkey, 2002, 2006) have known a well-deserved success. In the context of the spectacular advances in the field culminating in the Nobel Prize for Chemistry awarded to alkene metathesis and the follow-up research, a sixth NATO ASI of the kind was organized in Bucharest, Romania (July 21–August 2, 2008), with a focus on green metathesis chemistry.

Over 70 scientists, a blend of top international experts in the field, academics and young researchers or students, from 17 countries gathered to unveil and debate the utmost new progress in this domain. During the intense 11 days of activities, four main themes were repeatedly addressed in plenary lectures and invited short contributions: (i) Catalyst design and development of cost-efficient and user-friendly processes (Grela, Fogg, Delaude, Clavier, Balcar); (ii) Metathesis-related fine chemical synthesis (Demonceau, Marciniec); (iii) Architecturally complex assemblies and nanostructures (Astruc); (iv) Tailored polymers and new technologies for smart materials (Khosravi, Finkelshtein). In correlation, these topics, indicative of the vibrant research and imaginative use of metathesis in new realms, offered ideas for solving acute contemporary problems such as environmental issues and growing demand for active, selective and recyclable catalysts. Being an atom efficient catalytic reaction, olefin metathesis is, not surprisingly, frequently the key step in multifarious synthetic protocols.

Newly alkene metathesis has been called upon to promote green chemistry applications as finely illustrated during the NATO ASI (Grela: ionic liquids and “greener” solvents; Fogg: catalyst lifetime; Malacea: vegetal oils). The sophisticated chemistry ongoing in organic synthesis and in the polymer arena was masterfully illuminated from perspectives presented by Demonceau and Khosravi, respectively. The material science theme saw interdisciplinary bridges shrink further with presentations on metallodendrimers and precisely controlled nanomaterials (Astruc). A special feature of the Bucharest workshop, happening for the first time in a metathesis NATO ASI, namely a theoretical perspective on the reaction through in silico experiments (Cavallo et al.) generated a vivid interest in the audience.

Two poster sessions and a Round Table, liberated from limitations in time, provided perfect settings for deeper delving into the four themes. As remarked by many of the participants, there was an exceptionally enthusiastic, unbridled discussion stimulated by the session chairpersons (Fogg, Khosravi) and the eager,
young participants. Starting at the sessions, debate continued at breakfast, over lunch and dinner and, occasionally, during the social programme organized in a friendly style so as to facilitate contacts and stimulate exchange of ideas and information between research groups.

For this scientific event, we warmly thank the lecturers, the discussion leaders and, most of all, the participants. The Bucharest NATO ASI will be remembered as a forum for intense and free scientific interaction among individuals of different nationalities. We hope that this volume, while reflecting the multifaceted new achievements in metathesis, transmits to the readers this spirit and will be of real help to scientists and engineers active in this field.

Our special thanks are due to NATO for generously providing the financial support as well as to the Polytechnic University of Bucharest and the Institute of Organic Chemistry of the Romanian Academy who jointly hosted the scientific sessions.

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