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The New **Chemistry**

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Editor-in-chief **Nina Hall**



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Preface

The subject of chemistry is vast. It covers virtually all aspects of the behaviour of atoms and molecules – from the creation of the elements in the stars to the complex molecules of life. Chemistry, however, is much more than just about investigating the Universe at the molecular level; its central remit (which is quite different from those of other scientific disciplines) is to synthesize new forms of matter, many of which are extremely useful, for example, pharmaceuticals. *The New Chemistry* aims to illustrate the ingenuity and imaginative breadth of modern molecular science by presenting a showcase of research over the past 30 years. It is, of course, an impossible task to be comprehensive; were we to have covered every area, we would have easily filled several volumes. Nevertheless, we have collected here a broad range of reviews from some of the world's most renowned chemists (including several Nobel Prize winners) in areas where there have been recent exciting advances.

Most general books on chemistry published in the past have concentrated on applications and on the material benefits of chemical discoveries. We have taken a slightly different tack. This book looks at the underpinning science, such as the strategies behind making complex molecules, the intricate chemistry of metals, the chemistry that happens at surfaces, and the study of chemical bonding and reactions. We also wanted to illustrate the interdisciplinary nature of chemistry, in particular its central role in the life sciences and increasingly in the development of novel electronics and energy sources. We have also included areas less often covered in the standard chemistry book, such as nuclear chemistry and chemistry far from equilibrium.

One huge area that we have not been able to include is analytical chemistry. This subject is so large that it would easily fill a volume on its own. We do, of course, fully recognize that analytical techniques designed to solve the structures of molecules, such as nuclear magnetic resonance and X-ray crystallography, have revolutionized research both in pure chemistry and in molecular biology – as have chromatographic techniques that allow minute concentrations of molecules to be separated. For similar reasons of space we have not been able to review the improvements to the environment being made through the design of 'greener' industrial processes.

Despite these inevitable omissions, we hope that you will enjoy reading about developments in the core of the subject presented here. It is worth remembering that chemistry is about investigating and creating ultimate complexity in nature, and as such presents a wonderful intellectual challenge, which *The New Chemistry* aptly illustrates.

Nina Hall

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Chapter 6

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Chapter 7

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Chapter 8

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Chapter 10

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