

Preface

Supramolecular Chemistry is now a mature and highly vigorous field. In 2005 alone, some 2532 scientific papers used the word 'supramolecular' in their titles, keywords or abstracts! The term 'supramolecular' has origins at least to Webster's Dictionary in 1903, but was first applied in the modern sense by Jean-Marie Lehn in 1978 as the '... chemistry of molecular assemblies and of the intermolecular bond'. Lehn shared the 1987 Nobel Prize in Chemistry with Charles Pedersen and Donald Cram for their pioneering work in the field in the late 1960s and subsequent decades. Since that time, chemists have attained an astonishing degree of control over the 'non-covalent bond' and have used these techniques to synthesise a plethora of beautiful and intricate functional structures with dimensions on the nanometre scale. More recently, this ability to 'synthesise-up' nanoscale architectures and components has given rise to the field of 'nanochemistry' – the preparation and manipulation of molecular structures on length-scales of ca. 1–500 nm. The boundaries of nanochemistry and supramolecular chemistry are highly subjective although they are somewhat distinct areas. The modern explosion in nanochemistry is very much based, however, upon the fundamental understanding of intermolecular interactions engendered by supramolecular chemists. It thus makes sense for this book to provide a 'one-stop' brief introduction which traces the fascinating modern practice of the chemistry of the non-covalent bond from its fundamental origins through to its expression in the emergence of nanochemistry.

Both supramolecular chemistry and nanochemistry are now featuring ever more strongly in undergraduate and postgraduate degree courses throughout the world. The amount of each discipline which is taught is highly variable but is often a relatively small component of the undergraduate curriculum. The need for a concise introductory book that could serve as a basis for supramolecular chemistry courses of varying lengths was recognised by Jerry Atwood and one of us (JWS) in 1995. Andy Slade at Wiley (UK) has been a great believer in the concept and in 2000 Steed and Atwood published the very successful *Supramolecular Chemistry*, a book that has since even made it into a Russian-language edition. To Andy's dismay, however, this 'concise introduction' weighed in at over 700 pages. It turned out that there was a lot to cover! Five years later in 2005, Geff Ozin and Andre Arsenault did the same thing for nanochemistry, producing an extremely comprehensive overview of research in the field. Andy never gave up the idea of the concise textbook, however, and the idea rumbled around a South Kensington pub one evening while the three present authors were all working together in London. Since then, we have all moved institutions and it has taken

three years and a great deal of e-mails between three continents to bring the book to fruition but we hope that it will have been worth the wait. In this book, we have tried to provide a topical overview and introduction to current thinking in supramolecular chemistry and to show how supramolecular concepts evolve into nanochemical systems. By definition, this book is not comprehensive and we apologise in advance to the many fine researchers whose work we could not include. The examples we have chosen are those that best illustrate the fundamental concepts and breadth of the field. In order to highlight important (and readable!) entries into the supramolecular chemistry literature, we have chosen to adopt a system of 'key references' which are marked by a 'key symbol' at the start of most major sections. Key references are chosen predominantly from the secondary or review literature to give the interested student an up-to-date and, above-all, focused entry into the research literature for any subsection of the material which catches their interest (or is assigned as homework!). It is hoped in this way to guide the reader to the most useful or influential work as quickly as possible without the often bewildering effect that a mass of more or less obscure citations to the primary literature may have. Additional citations are given to provide useful further reading.

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