

# Preface

For such a diverse field as solid-state NMR, it is always a difficult matter to decide what should be covered in a single book of a reasonable page limit. Hopefully, many would agree that biological research and material science are the two major research themes in solid-state NMR. Also, a good understanding of the basic theory is mandatory before one could fully exploit the power of solid-state NMR to its fullest extent. With this in mind, the present volume of Topics in Current Chemistry starts with the chapter by Nielsen and co-workers, which focuses on the design principles of dipolar recoupling techniques. In a very succinct way, the authors have covered many techniques with potential applications in biological research, where the prominent features of different classes of recoupling pulse sequences are discussed incisively. In Chapter 2, the applications of solid-state NMR are illustrated in the context of amyloid fibrils. The techniques highlighted are mainly taken from the literature of amyloid research. These two chapters together provide a complementary account for the current status of biological solid-state NMR under magic-angle spinning conditions. In Chapter 3, Ulrich and co-workers review the latest progress in solid-state NMR of  $^{19}\text{F}$ -labeled membrane-active peptides bound to oriented native biomembranes. The authors generously share many practical hints in sample preparation and membrane alignment. The unique opportunity of  $^{19}\text{F}$  NMR in the progress towards *in-cell* NMR is well illustrated.

The theme of the second half of this volume is shifted to material science. The review by Fernandez and Pruski (Chapter 4) gives a timely account for the rapid advancing field of NMR of quadrupole nuclei. A vast collection of techniques addressing different important issues such as sensitivity and resolution enhancement are discussed in a very organized fashion. This chapter forms an excellent common ground for the discussion of NMR studies of different kinds of materials. Koller and co-workers describe in Chapter 5 the NMR of silica-based micro- and mesoporous materials, with particular emphasis on the different facets of zeolite research. The authors have compiled the literature in the past ten years to give a nice overview of the field, demonstrating clearly the power of solid-state NMR in the studies of catalytic materials. In the last chapter of the book Yesinowski discusses solid-state NMR of semiconductors (Chapter 6). Following a broad overview of the

general field, various relevant internal interactions constituting the overall spin Hamiltonian are discussed in detail, which provides a coherent framework for the critical evaluation of a large body of literature on bulk and nanoscaled semiconductors. This comprehensive review will not only serve as a roadmap for new comers, but also alert the experienced researchers to other important topics and issues of which they may not have been aware.

Overall, the contributors to this volume have provided first-hand accounts of various important research topics in solid-state NMR. Being the editor, I feel very privileged to work with my very distinguished colleagues, who have been at the frontier of their fields for many years. Thanks to their painstaking efforts I am very much convinced that this volume will be a useful reference for researchers and students who are interested in the principles and applications of solid-state NMR spectroscopy.

Fall 2011

Jerry C. C. Chan



<http://www.springer.com/978-3-642-24802-3>

Solid State NMR

Chan, J.C.C. (Ed.)

2012, XII, 320 p., Hardcover

ISBN: 978-3-642-24802-3