

Foreword

This volume of *Specialist Periodical Reports* is the first in a series covering the topic of Nuclear Magnetic Resonance. It largely follows the practice set by other *Specialist Periodical Reports*, but it should be obvious from the list of contents that on the whole this volume is intended to be oriented towards a discussion of the phenomenon of n.m.r. itself rather than towards a summary of applications of n.m.r. in given areas of chemistry. This is more readily done for some aspects of n.m.r. than for others; thus Chapter 3, Relaxation, is heavily phenomenon-orientated, whereas Chapter 8, Macromolecules and Solids, necessarily has some degree of chemical orientation. However, a deliberate attempt has been made to exclude chapter-headings based on compound-type or on a particular n.m.r.-active nucleus (*e.g.* ^{13}C Resonance'). Clearly, the division of n.m.r. into the areas given by the chapter-headings is arbitrary. In some instances there is overlap of material; it is hoped that such overlap is helpful and not excessive. Some cross-referencing has been included, but it is not feasible or desirable to cross-reference every time overlap occurs.

The extent of coverage of the chapters varies. This is deliberate, and follows from the phenomenon-orientation of the volume. Thus, since the aim is to cover fully the *phenomenon* of n.m.r., many papers which are judged (subjectively!) to represent trivial applications of the technique are not discussed. This is most apparent in those areas of n.m.r. which are most widely used in everyday chemical research. Thus Chapter 1, Chemical Shifts, contains no discussion of many research papers which mention chemical shift data (these probably constitute the majority of all published papers referring to n.m.r.!). On the other hand, a much higher proportion of the published papers mentioning n.m.r. bandshapes is included in Chapter 6 because the total output of research in this area is lower and, at the present time, contains more novelty (even in Chapter 6, however, nearly all references merely giving coalescence temperatures are omitted).

Some other aspects of n.m.r. besides the 'trivial applications' category have also been omitted. This may be for one of two reasons:

- (a) Omissions occur if the work is judged to be of little importance to chemistry. Most aspects in this category are of studies which would normally be classified as physics, *e.g.* most n.m.r. studies of metals and alloys.

- (b) Some areas of n.m.r. are omitted from this volume but further advances will be treated in later volumes. The Fourier Transformation technique has not, for instance, been treated fully here, because it is known that a comprehensive review is due to appear elsewhere at about the same time as this publication. A similar comment applies to Chemically Induced Dynamic Nuclear Polarization and to INDOR (something of these topics will appear in the forthcoming *Specialist Periodical Report* on Electron Spin Resonance). Broad-line n.m.r. studies of solids have in general not been treated in the present volume, but they will be discussed in Volume 2.

It is anticipated that *Specialist Periodical Reports* volumes on n.m.r. will appear annually, and it is intended that most of the chapter-headings (and the corresponding Reporters) will be the same from year to year. However, some chapters may be biennial and occasional re-grouping of some topics may be necessary.

The literature of n.m.r. is increasing at an alarming pace (making annual Reports a necessity), as the work mentioned in this volume demonstrates. It might be objected that there are already a number of review series on n.m.r. and that the Chemical Society series is duplicating other efforts. We believe, however, that this series is of particular value for several reasons:

- (a) It complements other volumes of the Chemical Society's *Specialist Periodical Reports*.
- (b) Its annual survey of the literature is of great assistance to the practising chemist.
- (c) Its phenomenon-orientation differentiates it from some other publications. In this context the *Annual Reports* — formerly *Annual Reviews* — of *N.M.R.* series, edited by E.F. Mooney, contains complementary articles, *inter alia*, under such headings as '¹⁹F N.m.r. Spectroscopy' on a regular basis. Other Chemical Society articles, such as the chapter on N.m.r. Spectroscopy in the *Specialist Periodical Reports* volumes entitled 'Spectroscopic Properties of Inorganic and Organometallic Compounds', are also complementary because they are largely compound-orientated.

It is hoped that the articles in this issue represent *critical* surveys of the literature, *i.e.* that they attempt to evaluate published results as well as to mention or reproduce them. The choice of Reporters, as experts in their fields, is intended to ensure this. The critical approach is, of course, easier to request than to fulfil, particularly in view of the volume of research literature which has to be covered. However, a corollary of this approach needs to be stated, namely that it makes some comments controversial. In this context it should be made clear that each chapter is written independently and that the comments and attitudes are those of the Reporter or Reporters concerned and do not necessarily represent a consensus by all the Reporters. As an example, I quote Dr. Raynes' closely reasoned but controversial views on the notation for the direction of chemical shifts (views with which I personally am in some disagreement.)

The period of coverage of this volume may be considered abnormal, since

it is the first of the series. The nominal coverage is from July 1970 to June 1971 inclusive, but in many instances material from the first half of 1970 is included in total (as in Chapter 6) or in part. In addition, most chapters contain some material which is introductory to the topic under consideration, and thus they refer to earlier important papers. Chapter 10 specifically covers a wider time-span (May 1969 to May 1971 inclusive) in order to make it follow consecutively on an earlier review of the subject. Naturally, a clear end to the coverage is impossible to achieve, as some journals arrive late or are mislaid, but omissions from the relevant period will be rectified in the next volume of the series.

The topicality and value of a volume of this type demands rapid publication, which bears heavily on all concerned. The problems of a first volume in a series make for special difficulties in this direction. Tribute should be paid to the Editorial Staff of the Chemical Society, and to the printers for coping admirably with this problem.

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