

Preface

The elements with which this Specialist Periodical Report is concerned are set out in the following (abbreviated) Periodic Table.

I	II		III	IV	V	VI	VII	VIII
							H	He
Li	Be		B	C	N	O	F	Ne
Na	Mg		Al	Si	P	S	Cl	Ar
K	Ca	Transition Elements	Ga	Ge	As	Se	Br	Kr
Rb	Sr		In	Sn	Sb	Te	I	Xe
Cs	Ba		Tl	Pb	Bi	Po	At	Rn
Fr	Ra							

Periodic Table

The Report contains eight chapters, one chapter being devoted to each of the main Groups. Our comprehensive review of the literature leaves no doubt that the amount of research effort which has as its major purpose the study of Main-group elements is less than that devoted to the Transition elements. It is also of interest that the amount of published work on the Main-group elements varies widely from Group to Group, and this is reflected in the relative length of the chapters. There are some common elements (particularly hydrogen, nitrogen, oxygen, and the halogens) which appear in many compounds but are not the central feature in the research, so that the space allocated to such elements is not a true reflection of their importance. Nevertheless, it is not difficult to recognise, from the Report, those 'cinderella' elements whose chemistry might merit further investigation.

The metals of Groups I and II have long been regarded as standards of ionic character; but the growing interest among chemists in the metallic state, and in weak co-ordinate bonding, points to possible increase in emphasis here in the future. Chapter 3 is large, but this is due primarily to the continued interest in boron chemistry. Chapter 4 is also large, but in this case the research effort would appear to be spread fairly evenly over all the elements of the Group. Chapter 5 is dominated by phosphorus chemistry, and arsenic, antimony, and bismuth have attracted less interest. This tendency is even more pronounced in Chapter 6, where there is a clear emphasis on

sulphur chemistry; selenium and tellurium are unpopular elements amongst inorganic chemists, and the chapter includes only one reference to polonium. Hydrogen is placed formally along with the halogens, and is included in Chapter 7. In fact, most relevant aspects of the chemistry of hydrogen are covered under the heading of the other elements involved, and the section of Chapter 7 on hydrogen deals only with aspects of protonic acid media, and hydrogen-bonding. The chemistry of simple ionic halides does not normally merit detailed treatment here, and discussion of the halogens is concerned largely with positive oxidation states. Chapter 8 is rather exceptional. There are exciting developments in the chemistry of the higher oxidation states of the noble gases, but this is essentially a specialist field, and the number of publications is small in comparison with earlier Groups.

Part of the Report on Organometallic Chemistry¹ is concerned with organo-derivatives of Main-group metals, and there are also Reports^{2,3} on 'Organic Compounds of Sulphur, Selenium, and Tellurium' and on 'Organophosphorus Chemistry'. For this reason we have not attempted any coverage of the literature so far as organo-derivatives of the Main-group elements is concerned, and have only included reference to them in cases where it seemed that they illustrated important aspects in the chemistry of the Main-group element involved.

C. C. Addison

The Chemical Society acknowledges permission to reproduce formulae from the following sources:

Chapter 3; Formula (13) from *Inorg. Chem.*, 1972, **11**, 369;

Formulae (20) and (21) from *J. Amer. Chem. Soc.*, 1972, **94**, 4768

Chapter 5; Formulae (4) and (5), (6), and (7) from *Naturwiss*, 1972, **59**, 78; 1971, **58**, 623; and 1972, **59**, 420, respectively.

Formulae (66) and (67), and (90) from *Inorg. Chem.*, 1971, **10**, pages 1935 and 2793, respectively.

¹ 'Organometallic Chemistry,' ed. F. G. A. Stone and E. W. Abel, (Specialist Periodical Reports), The Chemical Society, London, 1972, Vol. 1.

² 'Organic Compounds of Sulphur, Selenium, and Tellurium', ed. D. H. Reid (Specialist Periodical Reports), The Chemical Society, London, 1970, Vol. 1; 1973, Vol. 2.

³ 'Organophosphorus Chemistry', ed. S. Trippett (Specialist Periodical Reports), The Chemical Society, London, 1970—1973, Vols. 1—4.