

Preface

Since the publication of IUPAC's *Nomenclature of Inorganic Chemistry - Recommendations 1990* (the 'Red Book') inorganic chemistry has continued to expand and flourish, bringing with it the need to adapt and develop associated nomenclature. A revision of the Red Book was therefore initiated in 1998, under the guidance of the IUPAC Commission on Nomenclature of Inorganic Chemistry (CNIC) and then, on the abolition of CNIC in 2001, by a project group working under the auspices of the Division of Chemical Nomenclature and Structure Representation (Division VIII).

The need to ensure that inorganic and organic nomenclature systems are, as far as possible, consistent has resulted in extensive cooperation between the editors of the new Red Book and the revised *Nomenclature of Organic Compounds* (the 'Blue Book'). At present, the concept of preferred IUPAC names (PINs), an important element of the current revision of the Blue Book, has not been extended to inorganic nomenclature (though preferred names are used herein for organic, *i.e.* carbon-containing, compounds when appropriate). A future project on inorganic PINs is planned but will need to face the problem of choice between the equally valid nomenclature systems currently in use.

The current book supersedes not only the 1990 Red Book but also, where appropriate, *Nomenclature of Inorganic Chemistry II - Recommendations 2000* (Red Book II). One of the main changes from the old Red Book is the different organization of material, adopted to improve clarity. Thus, Chapters IR-5 (Compositional Nomenclature and Overview of Names of Ions and Radicals), IR-6 (Parent Hydride Names and Substitutive Nomenclature), and IR-7 (Additive Nomenclature) deal with the general characteristics of the three main nomenclature systems applied to inorganic compounds. (Note the notation 'IR-' to distinguish sections in the current book from those in the previous version, prefixed 'I-'). The next three chapters deal with their application, particularly additive nomenclature, to three large classes of compounds: inorganic acids (Chapter IR-8), coordination compounds (Chapter IR-9) and organometallic compounds (Chapter IR-10). Overall, the emphasis on

additive nomenclature (generalized from the classical nomenclature of coordination compounds) which was already apparent in the 1990 Red Book, is reinforced here. Examples are even included of organic compounds, from the borderline between inorganic and organic chemistry, which may be conveniently named using additive nomenclature (although their PINs will be different).

One important addition in this book is Chapter IR-10 on Organometallic Compounds, its separation from Coordination Compounds (Chapter IR-9) reflecting the huge growth in importance of organometallic chemistry and the very different problems associated with the presence of π -bonded ligands. Chapter IR-9 has also undergone considerable revision (*cf.* the old Chapter I-10), changes including the alphabetical ordering of ligands in names (and in formulae – see below) to avoid the ambiguity associated with assigning charge (Section IR-9.2.2.1), a clarification of the use of η and κ nomenclature in coordination and organometallic compounds (Section IR-9.2.4.3), the ordering of central atoms in polynuclear compounds (Section IR-9.2.5.1), the bringing together of sections on configuration (Section IR-9.3) and their separation from those on constitution (Section IR-9.3), and the addition of polyhedral symbols for T-shaped (Section IR-9.3.3.7) and see-saw (Section IR-9.3.3.8) molecules with guidance on how to choose between these and closely related structures (Section IR-9.3.2.2).

The chapter on Oxoacids and Derived Anions (I-9) has also been extensively modified. Now called Inorganic Acids and Derivatives (Chapter IR-8), it includes the slightly revised concept of 'Hydrogen Names' in Section IR-8.4 (and some traditional 'ous' and 'ic' names have been reinstated as they are required for organic nomenclature purposes, *i.e.* in the new Blue Book).

The reader facing the problem of how to name a given compound or species may find help in several ways. A flowchart is provided in Section IR-I.4 which will in most cases guide the user to a section or chapter where rules can be found for generating at least one possible name. A more detailed subject index is also provided in this book, and an extended

guide to possible alternative names of a wide range of simple inorganic compounds may be found in Table IX.

For most compounds, formulae are another important type of compositional or structural representation and for some compounds a formula is perhaps easier to construct. In Chapter IR-4 (Formulae) several changes are made in order to make the presentation of a formula and its corresponding name more consistent, *e.g.* the order of ligand citation (which does not now depend on the charge on the ligand) (Section IR-4.4.3.2) and the order and use of enclosing marks (simplified and more consistent with the usage proposed for the nomenclature of organic compounds) (Section IR-4.2.3). In addition, the use of ligand abbreviations can make formulae less cumbersome. Thus, recommendations for the construction and use of abbreviations are provided in Section IR-4.4.4, with an extensive list of established abbreviations given in Table VII (and with structural formulae for the ligands given in Table VIII).

Two chapters of the 1990 Red Book have been shortened or subsumed since in both areas extensive revision is still necessary. First, the chapter on Solids (IR-11) now describes only basic topics, more recent developments in this area tending to be covered by publications from the International Union of Crystallography (IUCr). It is to be hoped that future cooperation between IUPAC and IUCr will lead to the additional nomenclature required for the rapidly expanding field of solid state chemistry,

Second, boron chemistry, particular of polynuclear compounds, has also seen extensive development. Again, therefore, only the basics of the nomenclature of boron-containing compounds (*cf.* the separate chapter on boron nomenclature, I-11, in the old Red Book) are covered here, within Chapter IR-6 (Parent Hydride Names and Substitutive Nomenclature) while more advanced aspects are left for elaboration in a future project.

Other changes include sections on new elements and the procedure by which they are now named (Section IR-3.1) and a simplified coverage of the systematic method for naming rings and chains (adapted from Chapter II-5 of Red Book II). Lesser omissions

include the section on single strand polymers (now updated as Chapter II-7 in Red Book II) and the several different outdated versions of the Periodic Table. (That in the front inside cover is the IUPAC-agreed version). Some new recommendations represent breaks with tradition, in the interest of increased clarity and consistency. For example, the application of the ending 'ido' to all anionic ligands with 'ide' names in additive nomenclature (*e.g.* chlorido and cyanido instead of chloro and cyano, and hydrido throughout, *i.e.* no exception in boron nomenclature) is a move to a more systematic approach.

Thanks

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