

# CRITICAL STABILITY CONSTANTS

Volume 4: Inorganic Complexes

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Volume 4: Inorganic Complexes

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# PREFACE

Over the past fifteen years the Commission on Equilibrium Data of the Analytical Division of the International Union of Pure and Applied Chemistry has been sponsoring a noncritical compilation of metal complex formation constants and related equilibrium constants. This work was extensive in scope and resulted in the publication of two large volumes of *Stability Constants* by the Chemical Society (London). The first volume, edited by L. G. Sillen (for inorganic ligands) and by A. E. Martell (for organic ligands), was published in 1964 and covered the literature through 1962. The second volume, subtitled Supplement No. 1, edited by L. G. Sillen and E. Hogfeldt (for inorganic ligands) and by A. E. Martell and R. M. Smith (for organic ligands), was published in 1971 and covered the literature up to 1969. These two large compilations attempted to cover all papers in the field related to metal complex equilibria (heats, entropies, and free energies). Since it was the policy of the Commission during that period to avoid decisions concerning the quality and reliability of the published work, the compilation would frequently contain from ten to twenty values for a single equilibrium constant. In many cases the values would differ by one or even two orders of magnitude, thus frustrating readers who wanted to use the data without doing the extensive literature study necessary to determine the correct value of the constant in question.

Because of difficulties of this nature, and because of the general lack of usefulness of a noncritical compilation for teaching purposes and for scientists who are not sufficiently expert in the field of equilibrium to carry out their own evaluation, we have decided to concentrate our efforts in this area toward the development of a critical and unique compilation of metal complex equilibrium constants. Although it would seem that decisions between available sets of data must sometimes be arbitrary and therefore possibly unfair, we have found the application of reasonable guidelines leads directly to the elimination of a considerable fraction of the published data of doubtful value. Additional criteria and procedures that were worked out to handle the remaining literature are described in the *Introduction* of this book. Many of these methods are quite similar to those used in other compilations of critical data.

In cases where a considerable amount of material has accumulated, it is felt that most of our critical constants will stand the test of time. Many of the data listed, however, are based on only one or a very few literature references and are subject to change when better data come along. It should be fully understood that this compilation is a continually changing and growing body of data, and will be revised from time to time as new results of these systems appear in the literature.

The scope of these tables includes the heats, entropies, and free energies of all reactions involving organic and inorganic ligands. The magnitude of the work is such that far more than a thousand book pages will be required. In order that the material be available in convenient form, the amino acid complexes are presented in Volume 1 and amine complexes (which do not contain carboxylic acid functions) are included in Volume 2. The remaining organic complexes are the subject of Volume 3. Volume 4 comprises the inorganic complexes.

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