

PREFACE

This volume presents solubility data of the halides, oxyhalides and halogen complexes of groups four and five metals of the periodic table, titanium, zirconium, hafnium, vanadium, niobium and tantalum. The literature for binary and multicomponent systems has been covered up to the end of 1986. There was a great effort to have the literature survey as complete as possible, however, the editors will be grateful to have any omissions brought to their attention.

Except for the fluorides, the binary halides are predominantly covalent compounds highly susceptible to hydrolysis. No data on the solubility of the binary metal chlorides, bromides or iodides in water exists. The solubilities of these compounds in non-aqueous solvents are included. The oxyhalides and the salts of the halogen complexes solubilities are mainly studied in water and in aqueous solutions.

Phase diagrams are included for many of the multicomponent systems. For the simple eutonic systems phase diagrams were included only in the cases where no numerical data were reported in the original document, and the phase diagrams were the sole source of information.

Only those published results that report meaningful numerical data were considered for the volume. Papers that reported qualitative results with statements like "sparingly soluble", "insoluble", etc. were not considered. Papers in which the investigators failed to specify conditions such as temperature, equilibrium time, or methods of analysis were sometimes included. They were considered for the volume either if no other data were available for the system, or if the data were published in difficult to obtain older literature. The same criteria led the compiler to include estimates from a few graphically presented results.

The volume contains data on almost two hundred systems. Relatively few of the systems were studied over common ranges of temperature by more than one laboratory. Thus the opportunity to carry out evaluations is limited, and only sixteen systems are evaluated. When an evaluation was prepared the data were first compared by plotting them graphically to observe general agreement among the values from the various publications. Regression analysis was carried out in a few cases where the agreement among the various groups of investigators seemed to be good, using various polynomial functions. This was not done for systems where the data from different laboratories differed considerably and the reasons for the discrepancies were not clear.

The editors gratefully acknowledge advice and comments from members of the IUPAC Commission on Solubility Data, particularly the Chairman, Professor A. S. Kertes and the Coordinator for Solid/Liquid Systems, Dr. Mark Salomon. We thank Dr. Kurt Loening, Chemical Abstracts Service for providing Chemical Abstracts Registry Numbers. We thank Ms. Laura Johnson and Ms. Carolyn Dowie for typing the final camera ready manuscript.

The editors acknowledge the cooperation of the American Chemical Society, VAAP, the copyright agency of the USSR, and Pergamon Press for their permission to reproduce figures from their publications.

J. Hála
J. E. Purkyne University
Brno, Czechoslovakia

Susan A. Johnson
H. Lawrence Clever
Emory University
Atlanta, GA, USA

1987, October

A check of *Chemical Abstracts* through 1988, June did not find any additional papers on the solubility of these systems.

1989, January