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Book review

GMELIN HANDBOOK OF INORGANIC CHEMISTRY, Main Series, 8th Edition, TELLURIUM. Part B2. FLUORINE AND CHLORINE COMPOUNDS OF TELLURIUM, 1977, xviii + 152 pages, DM 373, \$ 171.60. Part B3. BROMINE, IODINE, SULFUR AND SELENIUM AND COMPLEX COMPOUNDS OF TELLURIUM, 1978, xxii + 183 pages, DM 491, \$ 245.50. G. Hantke, Chief Editor, Gmelin Institut für Anorganische Chemie der Max-Planck-Gesellschaft zur Förderung der Wissenschaften, Springer-Verlag, Berlin/Heidelberg/New York.

The "Tellurium" (Gmelin System-Number 11) supplemental volumes B2 and B3 conclude the coverage of the inorganic compounds of tellurium begun in volume B1 with the hydrogen, oxygen and nitrogen derivatives. The literature which appeared between 1940 and the end of 1973 was abstracted. Many of the more recent papers, some of them from 1975, were also included.

Volume B2 summarizes the general literature of tellurium-fluorine and tellurium-chlorine compounds, and provides detailed information on the formation, preparation, purification, structure; crystallographic, mechanical, thermal, electrical and spectral properties and chemical reactivity of these derivatives in the thorough and well-organized manner which is the trademark of Gmelin's Handbook. The tellurium-fluorine compounds TeF , TeF_2 , TeF_4 , TeF_5 , TeF_6 , $\text{TeF}_5(\text{OH})$, the ions TeF_6^{--} , TeF_5^- , TeF_5O^- , $\text{TeF}_4\text{O}^{--}$, $\text{TeF}_4\text{O}_2^{--}$, $\text{TeF}_4(\text{OH})^-$, $\text{TeF}_2\text{O}_2^{--}$, $\text{TeF}_2\text{O}_3^{--}$, TeFO_2^- , TeFO_3^- , and their alkali salts and the amidofluorides R_2NTeF_5 and $(\text{R}_2\text{N})_2\text{TeF}_4$ are described on 66 pages. The remaining 85 pages are devoted to the tellurium-chlorine compounds Te_2Cl , Te_3Cl_2 , TeCl , TeCl_2 , alkali trichlorotellurates(II), TeCl_4 , TeCl_2O , $\text{Te}_6\text{Cl}_{12}\text{O}_{11}$, TeN_3Cl_3 , $\text{Te}(\text{N}_3)_2\text{Cl}_2$, TeClF_5 , the ions TeCl_3^+ , TeCl_5^- , TeCl_6^{--} , $\text{Te}_2\text{Cl}_{10}^{--}$, $\text{Te}_3\text{Cl}_{13}$ and their salts and a description of the phase diagrams for TeCl_4/MCl , $\text{M}_2\text{TeCl}_6/\text{M}'_2\text{TeCl}_6$ and TeO_2/MCl (M, M' = alkali metal).

In volume B3 the tellurium-bromine and tellurium-iodine compounds are reviewed including tellurium-halogen derivatives with two different halogen atoms in the molecule. The section on tellurium-sulfur compounds covers binary tellurium sulfides, thiotellurates(IV) (TeS_3^{--}), thiotellurates(VI) (TeS_4^{--}), tellurium-sulfur-oxygen derivatives

[TeSO_3 , $\text{Te}_n\text{S}_3\text{O}_{10}$, $\text{Te}_2\text{O}_3\text{SO}_4$, $\text{H}_2\text{TeS}_2\text{O}$, Na_2TeSO_3 , $\text{Te}(\text{S}_2\text{O}_3)_2^{--}$, $\text{H}_2\text{Te}(\text{HSO}_4)_6$] and tellurium-sulfur-halogen compounds. The tellurium-selenium compounds are covered on 23 pages, with most of the section devoted to the tellurium-selenium system. The other derivatives treated in this section are Na_2TeSe_n ($n = 1, 3$), TeSeO_3 , $\text{F}_5\text{TeOXeOSeF}_5$, the system $\text{TeCl}_4/\text{SeCl}_4$, the ions $\text{Te}_2\text{Se}_8^{--}$, $\text{Te}_3\text{Se}_7^{--}$, $\text{Te}_4\text{Se}_6^{--}$ and tellurium-selenium-sulfur compounds $\text{Na}_2\text{TeS}_n\text{Se}_m$.

The last chapter surveys the complex compounds of tellurium. Data for the large number of complexes of tellurium(II) with alcohols, ammonia, amines, mercaptocarboxylic acids, alkylxanthogenic acids, dithiocarbamic acids, thiourea and its derivatives, selenourea, dialkyldithio-, dialkylthioseleno- and dialkyldiselenophosphinic acids and dialkyldithiophosphoric acids as ligands are presented with many drawings depicting the structures of these complexes. The review of the tellurium(IV) complexes shows that tellurium tetrahalides accept alcohols, ammonia, amines, pyridine and its derivatives, piperidine, pyridazine, chinoline, Schiff bases, carboxylic acid amides, acetonitrile, dialkyl sulfides and sulfoxides, dithiocarbamic acids, thiourea and its derivatives, S_4N_4 , $\text{S}_4\text{N}_4\text{H}_4$, dialkyl selenides and triphenylphosphine as ligands. The rather labile compounds of TeF_6 with amines are the only known complex derivatives of tellurium(VI).

Both volumes are written in German, but contain an English foreword, table of contents and section headings. These supplements to the main tellurium volume issued in 1940 provide a comprehensive, compact and, therefore, convenient source of information on inorganic tellurium compounds. The organometallic chemist interested in the preparation of organic tellurium derivatives will find in these volumes up-to-date methods for the synthesis of inorganic starting materials and their reactions with organic molecules. The claims and counter-claims about the existence and behavior of the lower-valent tellurium halides such as TeCl_2 , TeBr_2 and TeI_2 are clearly presented. The high-quality figures and the well-organized tables add to the value of these books. The information seeker will also be grateful for the many cross-references to the supplemental volume B1 and the main volume.

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