

Topical Keywords

The following Index contains all keywords of chapter 1 which refer to chapters, volumes or groups of volumes of the New Series. These "topical" keywords are printed in boldface in chapter 1.

angular correlations in α -, β -, and γ -spectroscopy

Topic of volume I/3.

Contents of the volume: The volume contains numerical tables for angular correlation computations in α -, β -, and γ -spectroscopy: 3j-, 6j-, 9j-symbols and Γ -coefficients. Volume I/3 has been published in 1968.

Data presented: Clebsch-Gordan coefficients, 3j-symbols, Racah coefficients, 6j-symbols, 9j-symbols, F-coefficient, Γ -coefficients.

Arrangement of the data: A compilation of the most usual definitions for correlation coefficients as well as the most important formulae for angular correlations are given in an introductory chapter. In the following chapter all tabulated coefficients are defined and commented. The tables are direct reproduced computer outputs. The last chapter contains a collection of useful angular functions as Legendre functions and associated functions of 1st kind and of triple correlation functions.

astronomy and astrophysics

Topic of volumes VI/1, VI/2, VI/3.

Contents of the volumes: Astronomy and astrophysics - dealt with in the 6th Edition in a chapter of volume III - is the topic of Group VI of the New Series. Volume VI/1 (published in 1964) covers the whole field of astronomy from astronomical instruments to the universe (see below).

In 1981 and 1982 the three subvolumes of volume VI/2 were published as an extension and supplement of volume VI/1. A new supplementary volume (VI/3) is in preparation. Two of the three subvolumes were published in 1993 (subvolume a) and 1995 (subvolume b).

Data presented: Telescopes, photoelectric detectors, photographic emulsions, spectrometers, spectrographs, interferometers, X-ray instruments, gamma-ray instruments, infrared detectors, radiometers, determination of astronomical latitude and longitude, time determination, astronomical constants (speed of light, radius of the earth, gravitational constant, obliquity of ecliptic etc.), solar parameters, interior, activity, sunspots, faculae and plagues, prominences and ejecta, flares etc., properties of planets (composition, structure, surface, atmospheres, magnetic field, ...), asteroids, meteors, meteorites, comets, interplanetary dust, zodiacal light, interplanetary particles, interplanetary magnetic field, abundances of elements in the solar system, age of solar system, classification of stars, colors, absolute magnitudes, mass, density, gravity, rotation, stellar atmospheres, structures and evolution, variable stars, peculiar stars, protostars, nebulae, white dwarfs, compact objects, X-ray sources, gamma-ray sources, double stars, star clusters and associations, interstellar matter, cosmic rays, Galaxy, galaxies, quasars, active galactic nuclei, compact sources, black holes, cosmologies, big bang.

Arrangement of the data: The main topics of astronomy and astrophysics are dealt with in VI/2 and 3 as follows (the subdivision in volume VI/1 is slightly different):

- 1 Astronomical instruments
- 2 Position and time determination, astronomical constants
- 3 The solar system
- 4 The stars
- 5 Special types of stars
- 6 Double stars and star clusters
- 7 Interstellar matter
- 8 Our Galaxy
- 9 Galaxies and the universe

atomic defects in metals and alloys

Topic of volume III/25.

Contents of the volume: The volume deals with all atomic defects (point defects) in metals as vacancies, self-interstitial atoms, solute atoms at either regular lattice sites or in interstitial positions. The chapters comprise production of atomic defects, properties and interactions of atomic defects, helium in metals.

The volume has been published in 1991. The literature is covered till the end of 1990.

Data presented: Production of defects: displacement energies by electron irradiation, damage rate by ion irradiation, production of Frenkel defects during implantation, capture cross sections for neutrons, onset energies for radiation damage, damage rates, displacement energy maps, defect saturation, cascade yield, vacancy concentrations and damage rates etc.

Properties and interaction of defects (Frenkel defects, self-interstitial atoms, vacancies): vacancy formation and migration enthalpy, recovery spectra, self-diffusion (Arrhenius plot, activation energy), onset temperature for vacancy migration, resistivity recovery, temperatures of complex formation and of annealing stages and other parameters characterizing defect properties.

Helium in metals: production processes and rates (He generation by neutron induced transmutations, other nuclear reactions, implantation), atomistic properties (interstitial and substitutional solubility, binding to defects, diffusion, clusters and bubbles, growth and coarsening).

Arrangement of the data: The data are presented in tables and figures. The methods for production of atomic defects and for the determination of their properties are described extensively. The properties of metals and alloys are presented in sections on bcc metals, fcc metals, hcp metals, metals with other structures, concentrated alloys (including superconducting alloys).

beta decay and electron capture

Topic of volume I/4.

Contents of the volume: The volume contains numerical tables for β -decay and electron capture functions needed to separate the contributions from the nucleus and the atomic shell in experimental data.

The volume has been published in 1969.

Data presented: Relations between electron momenta, total energies, kinetic energies and Bp-values; unscreened and screened β -decay Coulomb functions, integrated statistical factors, screening corrections, Coulomb functions of the bound orbital electron for electron capture.

Arrangement of the data: An introductory chapter presents formulae for β -decay and electron capture. The following tables are reproduced computer outputs.

binary alloys: phase equilibria, crystallographic and thermodynamic data

Topic of volume IV/5.

Contents of the volume: The volume contains phase diagrams of binary alloys supplemented by data on crystallographic and thermodynamic properties of the respective alloy.

The volume consists of a series of subvolumes. Between 1991 and 1997 seven subvolumes were published. Further subvolumes are in preparation.

Data presented: Tables on properties of elements: Atomic weight, density, melting point, boiling point, crystal structure, lattice parameters, allotropic modifications at normal pressure, high pressure modifications, enthalpy of fusion and of sublimation, entropy, heat capacity, phase transition temperatures and transformation enthalpies.

Binary alloys: phase diagram, crystal structure, lattice parameters and bonding angles of intermediate phases, thermodynamic data as thermodynamic activities, entropy and enthalpy of mixing and of formation, free energy of mixing and of formation, transformation entropies and enthalpies etc.

Arrangement of the data: The five subvolumes published up to the end of 1995 contain the following alloys:

Subvolume a: Ac-Au ... Au-Zr

Subvolume b: B-Ba ... C-Zr

Subvolume c: Ca-Cd ... Co-Zr

Subvolume d: Cr-Cs ... Cu-Zr

Subvolume e: Dy-Er ... Fr-Mo.

Subvolume f: Ga-Gd ... Hf-Zr

Subvolume g: Hg-Ho ... La-Zr

All subvolume contain tables on the properties of elements (see above) and indexes of binary alloys.

densities of liquid systems

Topic of volume IV/1a and of a chapter in volume IV/1b.

Contents of the volumes: Volume IV/1 contains in its subvolume IV/1a and in chapter 1 of subvolume IV/1b tables on densities of liquid solutions and mixtures. These data are a revised and extended version of tables in volume II/1 of the 6th Edition. Subvolume IV/1b contains another chapter on specific heats of solutions.

The subvolumes have been published in 1974 and 1977, respectively.

Data presented: Densities of liquid systems at and around room temperature.

Arrangement of the data: The chapters of subvolume IV/1a contain data on:

- Densities of non-aqueous systems (two inorganic components, one inorganic and one organic component, two organic components, three or more components).
- Densities of ternary and polynary aqueous systems (inorganic - inorganic, inorganic - organic and organic - organic systems containing water).

Chapter 1 of subvolume IV/1b adds data on:

- Densities of binary aqueous systems (inorganic substances - water, organic substances - water).

The chapter on non-aqueous systems contains an extensive register of systems.

diamagnetic susceptibility of crystals, mixtures and molecules

Topic of volume II/16.

Contents of the volume: The volume contains data on the diamagnetic susceptibility and the diamagnetic anisotropy of inorganic, organic and organometallic compounds, mixtures, molecules, molecule ions and molecule groups. Calculated susceptibilities are included and compared with experimental values. The volume represents a revised and extended edition of a chapter in volume II/10 of the 6th Edition. It was published in 1986.

Data presented: Diamagnetic bulk susceptibility of organic compounds, of inorganic and organometallic compounds and of mixtures, of the methylene group in various compounds.

Calculated diamagnetic susceptibility contributions of CO^{2+} -, NH^{3+} - and Si-ions in various compounds.

Diamagnetic anisotropy in organic, inorganic and organometallic compounds and molecules.

Arrangement of the data: The data are arranged in chapters according to the topics listed above. An introduction contains a review of the theoretical calculation methods of susceptibilities. No index of substances is provided.

diffusion in solid metals and alloys

Topic of volume III/26.

Contents of the volume: The volume presents a comprehensive collection of diffusion data for solid metals and alloys. Emphasis has been laid on the data obtained from the high precision experiments with artificial isotopes as well as on data from new techniques as electron microprobe analysis, secondary ion mass spectroscopy, ion beam backscattering profiling, nuclear magnetic relaxation, Mössbauer spectroscopy, after effect measurements etc.

The volume has been published in 1990.

Data presented: Preexponential factor and activation enthalpy of the diffusion coefficient (Arrhenius law), interdiffusion coefficient in inhomogeneous binary alloys and in ternary alloys, interdiffusion flux and interdiffusion coefficients, diffusion profiles, mass dependence (isotope effect parameter), pressure dependence (activation volume), surface diffusion coefficient.

Arrangement of the data: A extensive introduction supports information on the physical phenomena underlying diffusion, on theoretical tools, and a description of measuring methods.

The chapters and the substance groups dealt with in the chapters are: Selfdiffusion and impurity diffusion in metallic elements (chapters 2, 3): alkali, alkaline earth, scandium group, rare earth, titanium group, vanadium group, chromium group, manganese group, iron group, cobalt group, nickel group, noble metals, zinc group, aluminum group, groups IVB, VB, VIB, actinide group.

Selfdiffusion in homogeneous binary alloys and intermediate phases (chapter 4): various alloys (see list at the beginning of the chapter).

Chemical diffusion in inhomogeneous binary alloys (chapter 5): various alloys (see list at the beginning of the chapter).

Diffusion in amorphous alloys (chapter 7).

Diffusion of C, N, and O in metals (chapter 8): (elements only, groups as above).

Diffusion of H, D, and T in solid metals (chapter 9) (elements only, groups as above).

Mass and pressure dependence of diffusion in solid metals and alloys (chapter 10).

Diffusion in dislocations, grain and interface boundary diffusion (chapters 11,12).
Surface diffusion of metals (chapter 13).

elastic constants of dielectric crystals

Chapters in III/1, III/2, III/11, III/18, volume III/29a..

Contents of the volumes: Several volumes deal with elastic and related properties of crystals. Volumes III/1 and III/2 are out of print and will not be considered here. A revised and extended edition of these volumes are volume III/11 (published in 1979) and its supplement III/18 (published in 1984). Both volumes have again replaced by a revised edition split into the volumes III/29 (published in two subvolumes in 1992/93) and III/30 (to be published).

Subvolume III/29a contains in two chapters (chapter 1 and 2) the second order and third- and higher-order elastic constants. These chapters are arranged in the same way as chapters 1 and 2 in volumes III/11 and III/18.

Data presented: Second order elastic constants, their temperature coefficients and pressure coefficients, third-order stiffnesses, fourth-order stiffnesses.

Arrangement of the data: The data are arranged in separate tables for various crystal systems (cubic, hexagonal, trigonal, etc.) and within these tables in separate parts for elements, alloys, intermetallic compounds, solid solutions, etc.

An index of substances (element systems, names) is provided at the end of the volume.

electrical resistivity of metals and alloys

chapter in volumes III/15a,b.

Contents of the chapter: The resistivity of pure metals and dilute alloys is tabulated from low temperatures up to the melting point. Size effects and pressure effects have been considered. The literature is covered up to 1981.

Data presented: Pure metals: resistivity at room temperature, temperature dependence of resistivity from 10K up to the melting pint, resistivity at very low temperatures (residual resistivity), size effects (mean free path of electrons), pressure effects (pressure coefficient of resistivity, volume coefficient of resistivity).

Dilute alloys: resistivity increment produced by impurities ("impurity resistivity"), fitting parameters for Linde's law (quadratic dependence of impurity resistivity on difference in the number of valence electrons between impurity and host metal), deviations from Matthiessen's rule.

Arrangement of the data: The data are contained in chapter 1 of volume III/15. Most sections of this chapter are contained in subvolume a, only the section on pressure effects (and some additional data on alloys) is added in subvolume b.

electron - positron interactions

Topic of volume I/14.

Contents of the volume: This volume contains a compilation of all published data on annihilation of electrons and positrons into leptons and hadrons using large electron-positron colliders.

The volume has been published in 1992.

Data presented: Differential and total cross sections for lepton pair production, forward-backward asymmetry, two-body final states and inclusive states in hadronic cross sections, hadronic multiplicities, coupling constants, fragmentation functions.

Arrangement of the data: The data are arranged according to the individual processes (production of gamma quanta, lepton pairs, hadrons etc., two chapters on coupling constants and on fregmentation functions follow. In the last chapter the theoretical framework is described.

electron paramagnetic resonance data of coordination and organometallic transition metal compounds

Chapters in volumes II/2, II/8, II/10, II/11, II/12b.

Contents of the volumes: The volumes contain data on magnetic susceptibilities and electron paramagnetic resonance of coordination and organometallic compounds. For purpose of comparison some other compounds have also been included. Volumes II/8, 10, 11, 12 (published 1976, 1979, 1981 and 1984, respectively) are supplements to volume II/4 (published 1966).

Data presented: Results of electron spin resonance measurements: g-factor, parameters of the spin Hamiltonian (hyperfine splitting parameters, fine structure parameters of the spin Hamiltonian etc.).

Arrangement of the data: All volumes contain an extensive introduction providing the theoretical basis, selected diamagnetic ionic susceptibilities, Pascal constants, one-electron spin-orbit coupling constants, etc.

The data on susceptibilities and on EPR are presented in distinct parts of each volume (in volume II/12 in parts II/12a and II/12b).

The compounds are listed under the appropriate transition metal ion or atom. The different ions of a particular transition group element are ordered by their oxidation numbers. The group of substances following from that subdivision is arranged into following order: (1) Simple compounds and coordination compounds with simple anionic ligands, (2) coordination compounds with neutral or chelating ligands, organometallic compounds, biological compounds. For each experimental value the experimental method is given.

electron states and Fermi surfaces in metals

Topic of chapters in volumes III/13a,b,c.

Contents of the chapters: Volume III/13 contains in its three subvolumes chapters on electron states in metallic elements, compounds and alloys and in homogeneously strained metallic elements.

The subvolumes a,b, and c have been published in 1981, 1983 and 1984, respectively.

Data presented: Surveys of calculations and experiments on electron states and Fermi surfaces up to 1980. Band structures, Fermi surfaces, densities of states, linear dimensions and extremal areas of cross sections for 64 metallic elements and more than 300 compounds and alloys. Hydrostatic pressure, uniaxial stress, uniaxial strain, tetragonal shear and angular shear derivatives of extremal cross-sectional areas of the Fermi surface, local distortions produced by a homogeneous strain on various cross-sections of the Fermi surface, strain and stress derivatives of extremal cross-sectional areas of the Fermi surface as a function of crystal orientation. Parametrization schemes and results from first-principle calculations on strain dependences of parameters influenced by homogeneous strain.

Subvolumes a and c contain an appendix with a collection of Bravais lattices (conventional unit cells), primitive unit cells, reciprocal lattices and first Brillouin zones)

Arrangement of the data: The chapters are distributed on the three subvolumes as follows:

Subvolume a, chapter 2.2: Band structure and Fermi surfaces of metallic compounds (sp-metallic compounds, transition metal compounds, quasi one- and two-dimensional compounds, rare earth oxide, and other compounds).

Subvolume a, chapter 2.3: Band structure and Fermi surfaces of disordered alloys (sp-metallic alloys, noble metal alloys, transition metal alloys, intermediate phases, hydrides, amorphous alloys).

Subvolume b, chapter 3: Electron states and Fermi surfaces of homogeneously strained elements.

Subvolume c, chapter 5: Band structure and Fermi surfaces of metallic elements.

No index of substances is provided.

electroweak interactions

Topic of volume I/10.

Contents of the volume: This volume covers all knowledge about the so-called electroweak interaction, experimental facts as well as theoretical foundations. It, thus, shows some special features within the New Series of LB. The presentation of the experimental data in an intelligible form required a comprehensive review of the theoretical background. Therefore, in volume I/10 not only data are presented, but the theoretical basis of the combination of electromagnetic interaction and weak interaction in the "Standard Model" is explained in full extent without dealing with the derivation of the formulae necessary for the interpretation of the experimental results.

The volume has been published in 1988.

Data presented: Data and theoretical keywords are: electroweak theory, quantum electrodynamics, quantum flavour dynamics, quantum chromodynamics, Feynman rules, renormalization schemes, leptons (neutrino and antineutrino, electron, positron, muon, tau-lepton, tau-neutrino), quarks (charmed quark, beauty or bottom quark, top quark), flavour quantum number, hypercharge, isospin, charm, strangeness, B-meson, W boson, Z boson, Higgs particle, electromagnetic current, weak neutral current, weak charged current, grand unified theory, supersymmetry, superstrings.

Arrangement of the data: The experimental facts and the theoretical foundation necessary for its interpretation are arranged in the following chapters: Outline, the Standard Theory, the fermion sector, the gauge boson sector, the Higgs sector, the currents, beyond QFD.

The volume contains a subject index.

elementary particles, elastic and charge exchange scattering of elementary particles

Topic of volumes I/7, I/9.

Contents of the volumes: Volume I/7 contains data of elastic and charge exchange processes of strongly interaction particles. The volume has been published in 1973.

The large amount of new data lead to a supplement volume I/9 with three subvolumes I/9a,b1,b2, published in 1980, 1982 and 1983, respectively. The data presented in volume I/7 have not only been updated but extended into the energy range of several hundred GeV. Furthermore, results for incident momenta below 1 GeV/c have been included. Subvolume I/9b2 is devoted to methods and results of phenomenological analyses. The main chapter of this subvolumes contains a critical review of the various methods of partial wave analysis and determination of scattering amplitudes. A (more than 100 page) appendix contains a collection of pion - nucleon scattering formulas.

Data presented: Differential cross sections, total cross sections, polarization parameters, scattering amplitudes at 0° and 180° (Volumes I/7, I/9a,b1).

Volume I/9b2 discusses theoretical methods and phenomenological analyses as partial wave and amplitude analyses, forward amplitudes, dispersion relations, meson-nucleon coupling constants, nucleon and pion form factors, Coulomb interference, Regge poles, isospin bounds etc.

Arrangement of the data: An introductory chapter (in I/7 as well as in I/9a) comprises the notation, constants and general relations in scattering processes.

The data are arranged in chapters on (1) nucleon - nucleon scattering (proton - proton, proton - deuteron, neutron - proton, neutron - nuclei, antiproton - proton, antiproton - deuteron), (2) K^\pm - nucleon scattering (kaon - proton, deuteron, neutron), (3) π^\pm - proton scattering.

Chapters (1) and (2) of volume I/9 are contained in subvolume I/9a, subvolume I/9b1 consists of chapter 3.

elementary particles, photoproduction

Topic of volume I/8.

Contents of the volume: The scattering data in volumes I/6 and I/7 are complemented in this volume by results of particle production by gamma-beams (photoproduction) and of elastic scattering of photons (Compton-scattering). The data in the resonance region (< 1.5 GeV) are given in detail, the data above 1.5 GeV - being not known in such detail and accuracy - are presented only in figures.

The volume has been published in 1972.

Data presented: The tables contain photon (laboratory) energy and total energy, scattering angle of third particle, differential cross section, invariant differential cross section, momentum of incoming photon, four momentum transfer.

The figures show total cross sections, Compton scattering results, data for photoproduction of pseudoscalar mesons, vector mesons, baryon resonances and particles with $S = \pm 1$.

Arrangement of the data: The data for photoproduction below 1.5 GeV are presented in sections on Compton scattering, on photoproduction of π and η mesons, and on photoproduction of K mesons, each section contains tables, comments, figures and references. Tables are given for each reaction.

elementary particles, production spectra

Chapter in volume I/6 "Properties and production spectra of elementary particles".

Contents of the volume: Chapter 3 of volume I/6 (published in 1972) contains data on cross sections for the production of charged particles in proton - proton collisions as a function of various kinematic variable.

Data presented: Cross sections for the production of negative and positive pions and kaons, antiprotons and protons from proton-proton interactions.

Arrangement of the data: Being the first of a series of volumes on scattering processes the volume contains an introductory chapter with notations, constants and general relations (chapter 2). In the following chapters the cross sections are listed and discussed.

elementary particles, properties

Chapter in volume I/6.

Contents of the chapter: The first chapter in volume I/6 (published in 1972) presents tables on the properties of elementary particles, containing also coupling constants and form factors.

Data presented: General formulae for decays and resonance, and for two-particle reactions, tables of particle properties (mass, lifetime, magnetic moment etc.) and decay coupling constants, effective range parameters and coupling constants of stable vertices, electromagnetic form factors and SU(3)-comparison.

Arrangement of the data: The chapters contain mostly formulae defining electroweak, weak, superweak and strong interactions, classification of particles and resonances, dispersion formulae etc. Tables on important basic properties of elementary particles are provided.

energy levels of nuclei

Topic of volume I/1.

Contents of the volume: The volume contains the known energy levels and transitions for all nuclei from $A = 5$ to $A = 257$. The essential part of the volume are levels and decay schemes. These are supplemented by tables and special data. The volume has been published in 1961.

Data presented: The tables and figures summarize the experimental information on the energy levels of nuclei:

Light nuclei: For each level the following parameters are given: excitation energy above ground state, total parity, isobaric spin quantum number, half-life or mean life of a state, half-width of a state, the known modes of decay.

Medium mass nuclei: Presented are level schemes including information about beta-ray energies and intensities, electron capture energies and intensities, gamma-ray energies and intensities, adopted mass differences, spin and parity assignments, mass links.

Heavy nuclei: for each nuclide one figure is given containing data on: ground level of the parents and energy level data for the listed nuclide, decay data, intensities of radiation of parent nuclides into the level of the listed nuclide etc.; a corresponding table informs about levels (assignment of quantum numbers to the levels and arguments supporting these assignments, energy levels of ground state, spin) and radiation

(type of radiation emitted, energy, intensity, multipolarity of gamma-transitions, ft-values of beta- or electron-capture branches, hindrance factor of alpha groups).

Arrangement of the data: The data are divided in three chapters: $A = 5$ to $A = 20$, $A = 21$ to $A = 212$ and $A = 213$ to $A = 257$, written by different authors. Each part has an introduction, a data part and a section with references. A list of nuclides is provided at the beginning of the volume.

epitaxy data of inorganic and organic crystals

Topic of volume III/8.

Contents of the volume: This volume contains epitaxy data of inorganic and organic crystals as an extension of the volumes III/5, 6 and 7 on crystal structure data. The planes, directions and periods and the misfits of orientation are compiled for about 3700 epitaxial systems.

The volume has been published in 1972.

Data presented: The tables contain for each substrate: Phases (substrate/deposit), planes (substrate/deposit), directions (substrate/ deposit), periods (substrate/deposit), misfit, reference.

Arrangement of the data: The data are arranged in four chapters: epitaxies of inorganic deposit crystals on inorganic substrate crystals, epitaxies of organic deposit crystals on inorganic substrate crystals, epitaxies of inorganic deposit crystals on organic substrate crystals, epitaxies of organic deposit crystals on organic substrate crystals. Substance groups dealt with are: elements and alloys, halogenides, oxides and hydroxides, oxygen compounds of the halides, compounds of selenium and tellurium, nitrogen compounds, phosphorus compounds, compounds of arsenic and antimony, carbon compounds, silicon compounds, boron compounds, chromium and molybdenum compounds, oxygen compounds of manganese, organic deposit crystals and substrate crystals.

The volume contains substance indexes.

ferroelectrics and antiferroelectrics

Topic of volumes III/3, III/9, III/16, III/28.

Contents of the volumes: The volumes present data on ferroelectric and antiferroelectric substances (including solid solutions) and substances closely related to them. The data included are those which give information on the ferroelectric or antiferroelectric character of the substances and are important in connection with it.

Volumes III/3 and III/9 have been replaced by the revised, updated and extended volume III/16. Both are not available and will not be referred to in the following. Volume III/16 covers all literature up to 1978. Volume III/28 is a supplement and extension presenting data till 1986 (in a few cases till 1988).

Data presented: The information is ordered for each substance section (see below) in subsections characterizing various topics:

1 History; fundamental quantities: Discoverer, year of discovery; phases, state (F,A,P), crystal system, space group of each phase, transition temperatures, direction of spontaneous polarization, melting point, density, transparency and color, cleavage plane, deliquescence and efflorescence.

2 Material preparation; Crystal growth: Methods, solubility in fluxes and solvents; crystal form, axes.

3 Crystal structure: Unit cell parameters, positional and temperature parameters, interatomic distances and bond angles, structural changes associated with phase transitions.

4 Lattice distortions: Thermal expansion, lattice deformation associated with phase transitions.

5 Dielectric properties: Dielectric constants, nonlinear dielectric properties, spontaneous polarization and coercive fields, pyroelectric effect, electrocaloric effect.

6 Thermal properties: Heat capacity, transition heat, transition entropy, thermal conductivity.

7 Electromechanical properties: Piezoelectricity, electrostriction, nonlinear electromechanical properties.

8 Elastic properties: Elastic compliances and stiffness, nonlinear elastic properties

9 Optical properties refractive indices, birefringence, reflection and absorption, electrooptic effect, piezooptic effect (photoelastic effect), optical activity, Faraday effect, nonlinear optical properties.

10 Light scattering: Raman scattering, Brillouin scattering, Rayleigh scattering.

11 Electrical conduction: Conductivity, breakdown strength, thermoelectric effect, photoconductivity, photoemission, superconductivity, band structure.

12 Magnetic properties: Magnetic susceptibility, spontaneous magnetization, magnetic structure, magnetoelectric effect.

13 Magnetic resonance: NMR, ESR, ENDOR.

14 Mössbauer effect, Mössbauer effect, Bragg reflections due to structural diffraction phenomena modulations, diffuse and inelastic scattering, EXAFS.

15 Domains: Domain structure, effects of electric field and mechanical stress

16 Miscellanea: thin layers, surface layers, radiation damage, plasticity, dislocation, point defects, twin structure, stripe pattern, paraelectric resonance.

Arrangement of the data: The data are arranged in sections for the various groups of ferroelectrics. Oxides have been dealt with in the subvolumes 16a and 28a, inorganic crystals other than oxides, organic crystals, polymers, liquid crystals and some other substances are considered in subvolumes III/16b and III/28b.

The sections are:

Oxides (x: only in subvolume III/16a, y: only in subvolume III/28a, xy: in both subvolumes)

1 Perovskite-type oxides (xy)

2 WO_3 (xy)

3 LiNbO_3 family (xy)

4 YMnO_3 family (x)

5 SrTeO_3 family (xy)

6 Tungsten-bronze-type oxides (xy)

7 Pyrochlore-type oxides (xy)

8 $\text{Sr}_2\text{Nb}_2\text{O}_7$ family (xy)

9 Layer-structure oxides (xy)

10 BaAl_2O_4 -type oxides (xy)

11 $\text{Pb}_3\text{Ge}_3\text{O}_{11}$ family (xy)

11 α $\text{LiNaGe}_4\text{O}_9$ (y)

11 β $\text{Li}_2\text{Ge}_7\text{O}_{15}$ (y)

12 GMO ($\text{Gd}_2(\text{MoO}_4)_3$) family (xy)

13 Boracite-type family (xy)

Inorganic crystals other than oxides (x: only in subvolume III/16b, xy: in both subvolumes)

- 14 SbSI family (xy)
- 15 HCl family (xy)
- 16 NaNO_2 family (xy)
- 17 KNO_3 family (xy)
- 18 PbHPO_4 family (xy)
- 19 KDP (KH_2PO_4) family (xy)
- 20 $(\text{NH}_4)_2\text{SO}_4$ family (xy)
- 21 NH_4HSO_4 family (xy)
- 22 $(\text{NH}_4)_3\text{H}(\text{SO}_4)_2$ family (xy)
- 23 NH_4LiSO_4 family (xy)
- 24 Langbeinite-type family (xy)
- 25 Lecontite ($\text{NaNH}_4\text{SO}_4 \cdot 2\text{H}_2\text{O}$) family (xy)
- 26 Alum ($\text{NH}_4\text{Fe}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$) family (xy)
- 27 GASH ($\text{C}(\text{NH}_2)_3\text{Al}(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$) family (xy)
- 28 $\text{LiH}_3(\text{SeO}_3)_2$ family (xy)
- 29. Colemanite ($\text{Ca}_2\text{B}_6\text{O}_{11} \cdot 5\text{H}_2\text{O}$) (x)
- 30 $\text{K}_4\text{Fe}(\text{CN})_6 \cdot 3\text{H}_2\text{O}$ family (xy)

Organic crystals (x: only in subvolume III/16b, y: only in subvolume III/28b, xy: in both sub-volumes)

- 31 $\text{SC}(\text{NH}_2)_2$ (xy)
- 32 $\text{N}(\text{CH}_3)_4\text{HgCl}_3$ family (xy)
- 33 $\text{Cu}(\text{HCOO})_2 \cdot 4\text{H}_2\text{O}$ (x)
- 34 DSP ($\text{Ca}_2\text{Sr}(\text{CH}_3\text{CH}_2\text{COO})_6$) family (xy)
- 35 $\text{CH}_2\text{ClCOONH}_4$ family (xy)
- 36 TGS ($(\text{NH}_2\text{CH}_2\text{COOH})_3 \cdot \text{H}_2\text{SO}_4$) family (xy)
- 37 $\text{NH}_2\text{CH}_2\text{COOH} \cdot \text{AgNO}_3$ (x)
- 38 $(\text{NH}_2\text{CH}_2\text{COOH})_2 \cdot \text{HNO}_3$ (xy)
- 39 $(\text{NH}_2\text{CH}_2\text{COOH})_2 \cdot \text{MnCl}_2 \cdot 2\text{H}_2\text{O}$ (x)
- 40 $(\text{CH}_3\text{NHCH}_2\text{COOH})_3 \cdot \text{CaCl}_2$ (xy)
- 40 α $(\text{CH}_3)_3\text{NCH}_2\text{COO} \cdot \text{H}_3\text{PO}_4$ (y)
- 40 β $(\text{CH}_3)_3\text{NCH}_2\text{COO} \cdot \text{CaCl}_2 \cdot 2\text{H}_2\text{O}$ (y)
- 41 Rochelle salt family (xy)
- 42 $\text{LiNH}_4\text{C}_4\text{H}_4\text{O}_6 \cdot \text{H}_2\text{O}$ family (xy)

Miscellanea (y: only in subvolume III/28a, xy: in both subvolumes)

- 43 Miscellaneous crystals (xy)
- 43 α High polymer ferroelectrics (y)
- 44 Liquid crystals and related liquids (xy)

Each subvolume contains a two-dimensional survey which indicates where the required data for special properties and individual substances can be found. In subvolumes III/18a and b common surveys for the volumes III/16a,28a (oxides) and for III/16b,28b (non-oxides) are provided.

Each subvolume contains a substance index. A common substance index for all four subvolumes III/16a,b,28a,b can be found in III/28b.

fundamental constants

Topic of subvolume b of the volume "Units and fundamental constants in physics and chemistry".

Contents of the volume: The main part of this volume consists of descriptions of experimental techniques of those of the physical constants which are thought to be the most important ones, either from the point of view of the scientists, or from practical considerations ("fundamental

constants"). Recent developments as Josephson effect and quantum Hall effect are included to some extent.

The volume has been published in 1992.

Data presented: Gravitational constant, speed of light, Planck constant, elementary charge, magnetic flux quantum, gyromagnetic coefficient of the proton, quantized Hall resistance, Bohr magneton, nuclear magneton, fine-structure constant, Rydberg constant, atomic masses of pure nuclides, Avogadro constant, Faraday constant, molar gas constant, Boltzmann constant, Stefan-Boltzmann constant.

Arrangement of the data: The volume begins with a discussion of the role of fundamental constants in physics and chemistry, including the relations between constants and units, the CODATA classification scheme, least squares adjustments a.o.

The following sections on the experimental determination of fundamental constants are mostly subdivided into subsections as basic relations, relations to other constants, experimental results, sources of uncertainties.

Two chapters on the adjustment of the fundamental constants (methods, the 1986 adjustment) and on recommended values of the fundamental constants - status in 1992 - follow. The recommended values included besides of fundamental constants listed above; proton-electron mass ratio, relative atomic masses, g-factor of free electron and muon, electron and nuclear magnetic moment ratios, gyromagnetic ratio, silicon lattice spacing, muon-proton magnetic moment ratio, Newtonian constant of gravitation etc.

The volume is closed with tables of fundamental constants and maintained units in alphabetical order, energy conversion factors, covariance and correlation coefficients, naturally occurring nuclides, periodic table of the element, also with a subject index to subvolumes a and b.

geophysics of the solid earth, the moon and the planets

Topic of volume V/2.

Contents of the volume: This volume contains data on the earth as a solid body, on its position in the solar system, its field in space and its inner composition, furthermore data on the moon and some planets in the solar system. By reason of the theme many contributions contain more text than tables and figures, even by trying to restrict the text parts to the unavoidable minimum.

Volume V/2 consists of two subvolumes V/2a and b, published in 1983 and 1985, respectively.

Data presented: Origin, orbital motion and rotation of the earth, earthquakes, seismic waves, structure, elastic and rheological properties, density of the earth's interior and its crust and upper mantle, oceanic and continental heat flow data, radioactive heat production of the crust, electrical conductivity, composition, tides, gravity potential, figure, geomagnetic field, palaeomagnetism, archaeomagnetism, surface relief, crustal movements, global tectonics.

Terrestrial planetary bodies (Mercury, Venus, Moon, Mars), age, surface structures, gravity, lunar seismology, magnetic fields, electrical conductivity, heat flow, temperature density, pressure etc.

Arrangement of the data: The data are arranged in the following chapters: (1) the earth in the planetary system, (2) properties of the solid earth, (3) gravity field and the figure of the earth, (4) magnetic field of the earth, (5) transport of masses in the earth's interior, (6) planetology of terrestrial planets. These chapters are distributed on the two subvolumes not thematically but according to the delivery of the manuscripts. Thus subvolume V/2a contains chapters 1, 3 and 6 and several sections of chapters 2 and 5, whereas subvolume V/2b contains chapter 4 and the remaining parts of chapters 2 and 5.

A subject index for both subvolumes of V/2a,b (including V/1a,b too) is provided at the end of subvolume V/2b.

heat capacities of liquid systems

Chapter in volume IV/1b.

Contents of the volumes: Volume IV/1 contains in two subvolumes data on densities of liquid systems. In addition chapter 2 of subvolume IV/1b presents data on heat capacities. This subvolume was published in 1977.

Data presented: Values of heat capacities of binary and ternary aqueous and non-aqueous systems as functions of temperature and concentration at 1 atm.

Arrangement of the data: The chapter is subdivided into sections on binary systems (inorganic and organic substances - water, inorganic and organic substances - organic solvent),

ternary systems (inorganic substances - inorganic substances - water, organic substances - organic substances - water). For the ternary systems only references are given.

heats of mixing and solution of liquid systems

Topic of volume IV/2.

Contents of the volumes: This volume deals with heat effects of mixing for binary and polynary systems. Due to the immense amount of published data there are many systems for which only references

instead of numerical values have been included. The informations represent a supplement or continuation of tables in volume II/4 of the 6th Edition. Literature is included completely till 1971 and partly till 1974.

Data presented: Integral and differential enthalpies of solution and dilution, enthalpies of mixing.

Arrangement of the data: The data are presented in sections on

- aqueous systems (inorganic, organic and polymer substances - water, ternary and polynary systems containing water)

- non-aqueous systems (inorganic systems - inorganic systems, inorganic systems - organic systems, organic systems - organic systems, polymer systems - inorganic and organic systems, ternary and polynary systems not containing water).

An extensive index of systems is provided.

high frequency properties of dielectric crystals

Chapters in III/1, III/2, III/11, III/18, volume III/30.

Contents of the volumes: Several volumes deal with low and high frequency properties of dielectric crystals. Volumes III/1 and III/2 are out of print and will not be considered here. A revised and extended edition of these volumes are volume III/11 (published in 1979) and its supplement III/18 (published in 1984). Both volumes have been partly replaced by a revised edition. Volume III/29 (published in two subvolumes in 1992/93) contains the low frequency properties. Volume III/30 (subvolume a published in 1996) will contain the high frequency properties.

Volumes III/11 and III/18 contain in their chapters 5 and 6 piezooptic and electrooptic constants and nonlinear dielectric susceptibilities.

Data presented: Piezooptic coefficients, elastooptic coefficients, linear and quadratic electrooptic coefficients, index of refraction, temperature coefficients of linear electrooptic coefficients and of index of refraction, electrogyration, nonlinear dielectric susceptibilities (second and third harmonic generation of light).

Arrangement of the data: The data are arranged in separate sections for various crystal systems (cubic, hexagonal, trigonal, etc.).

An index of substances (element systems, names) is provided at the end of the volume.

high pressure properties of liquids and liquid systems

Sections in the chapters of volume IV/4.

Contents of the volume: Volume IV/4 contains data on the pressure dependence of physical properties of elements, inorganic and organic compounds, of liquids and of aqueous and non-aqueous systems.

Data presented: Pressure dependence of density, compressibility, heat capacity, solubility of the components of mixtures etc. Enthalpy of vaporization, vapour pressure, phase equilibria in liquid mixtures, surface tension, dilution volume, excess enthalpy, excess volume near and above the critical area etc.

Pressure and temperature dependence of transport phenomena, electrical conductivity, diffusion coefficient, transference numbers, equivalent conductivity, ionic conductivity, dissociation equilibria etc.

Pressure dependence of dielectric constant etc.

Pressure dependence of optical spectra, shift of spectral lines, Raman frequencies, Mössbauer spectra, fluorescence etc.

Pressure dependence of kinetic phenomena, decomposition and formation equilibria, reaction velocities, excimer formation velocities, viscosity, density, spin-lattice relaxation time etc.

Arrangement of data: The data are arranged in chapters on phase equilibria under pressure, compressibility, thermal and caloric properties under pressure, systems in the neighborhood and above the critical area, transport properties under pressure, dielectric constants and other static electric and magnetic properties under pressure, optical phenomena under pressure, kinetic phenomena under pressure.

An index of elements, compounds and systems is provided.

high pressure properties of solids

Sections in the chapters of volume IV/4.

Contents of the volume: Volume IV/4 contains data on the pressure dependence of physical properties of elements, inorganic and organic compounds, of liquids and of aqueous and non-aqueous systems.

Data presented: Pressure dependence of phase equilibria, phase diagram, melting point, enthalpy and entropy of melting, phase transition temperatures, entropy of transformation etc.

Pressure dependence of density, lattice parameters, thermal expansion, elastic constants, compressibility, heat capacity, sound velocity etc.

Pressure and temperature dependence of transport phenomena, electrical conductivity, diffusion coefficient etc.

Pressure dependence of dielectric constant, thermovoltage, Curie temperature, Néel temperature etc.

Pressure dependence of optical spectra, Raman frequencies, Mössbauer spectra, fluorescence etc.

Pressure dependence of kinetic phenomena, viscosity, spin-lattice relaxation time.

Arrangement of data: The data are arranged in chapters on phase equilibria under pressure, compressibility, thermal and caloric properties under pressure, systems in the neighborhood and above the critical area, transport properties under pressure, dielectric constants and other static electric and magnetic properties under pressure, optical phenomena under pressure, kinetic phenomena under pressure.

An index of elements, compounds and systems is provided.

intrinsic magnetic properties of metals

Topic of volumes III/19, III/32.

Contents of the volumes: Subvolumes a ... f of volume III/19 deal with the intrinsic magnetic properties of metals, alloys and metallic compounds, which contain at least one transition element. Not only data on magnetic properties are listed but also those nonmagnetic properties have been included which, to some extent, depend on the magnetic state of the metallic system. As intrinsic properties those are defined which depend only on the chemical composition and on the crystal structure of the metal.

Further subvolumes of III/19 contain preparation-dependent properties (thin films and liquid quenched alloys) and materials developed for technical applications (soft and hard magnetic alloys, Invar and Elinvar alloys).

The nine subvolumes a,b,c,d1,d2,e1,e2,f1,f2 were published between 1986 and 1994.

Volume III/32a - published in 1997 - is the first subvolume of a series of supplements and extensions to III/19. It supplements volume III/19a and parts of III/19c.

Data presented: The volumes contain data on almost all relevant properties of metals as: Magnetic properties: ferromagnetic coercivity, ferro- and ferrimagnetic Curie temperatures, paramagnetic Curie temperature, exchange energy, ferromagnetic resonance, g-factor, hyperfine fields, isomer shift, magnetooptical Kerr effect, magnetic moment, magnetic order, magnetic phase diagrams and transition temperatures, magnetic structure, magnetic susceptibility, magnetization (spontaneous, saturation, remanent etc.), magnetocrystalline anisotropy, magnetostriction coefficient, Néel temperature, spin wave data, type of magnetism etc.

Structural and electronic properties: bulk modulus, elastic constants, lattice parameters, phase diagrams, thermal expansion; band structure, electron density of states, Fermi surfaces etc.

Other properties: electrical conductivity, superconducting transition temperatures, transport properties as magnetoresistivity, Seebeck and Hall coefficients, thermoelectric power, thermodynamic properties as heat capacities, Debye temperature, Mössbauer spectroscopy data, nuclear magnetic resonance data, spin lattice relaxation time, Knight shift, neutron diffraction results and many others.

Arrangement of the data: The data are arranged in chapters on substance group as follows:

- 3d, 4d, 5d elements, alloys and compounds between 3d, 4d and 5d elements (subvolume a)
- alloys and compounds of 3d elements with main group elements (subvolumes b and c)
- alloys and compounds of 4d and 5d elements with main group elements (subvolume c)
- rare earth (4f) elements and hydrides, (subvolume d1)
- alloys between rare earth elements (subvolume d1)
- compounds between rare earth elements and 3d, 4d or 5d elements (subvolume d2)
- compounds of rare earth elements with main group elements (subvolumes e1, e2)
- actinide (5f) elements (subvolume f1)
- compounds between actinide elements and 3d, 4d or 5d elements (subvolume f1).
- compounds between actinide elements and main group elements (heavy fermion systems, binary and pseudobinary compounds) (subvolume f2)

Each section within these chapters begins with a survey about the substances and properties dealt with in this section.

Subvolume f2 contains a Substance Index for all nine subvolumes.

Kondo and spin fluctuation systems, spin glasses

Chapters in volume III/15a.

Contents of the chapter: Discussed are

- anomalies in the electrical resistivity, thermopower, susceptibility, specific heat and other physical properties of dilute alloys with magnetic impurities at low temperatures (Kondo effect)
- substance with unstable magnetic moments (spin fluctuation systems)
- substance with higher concentrations of magnetic impurities with randomly frozen in spin (spin glasses).

The literature is covered up to 1980.

Data presented: Impurity contribution to resistivity, specific susceptibility and molar heat, total thermopower, Kondo temperature, spin fluctuation temperature, freezing temperature of spin glasses

Arrangement of the data: Chapter 2 of volume III/15a. Data presented in tables and figures.

liquid crystals

Topic of volume IV/7.

Contents of the volumes: The volume is concerned with critically selected and assessed data in the field of liquid crystalline compounds. A series of ten subvolumes is planned. Six subvolumes (a,b,c,d,e,f) have been published in 1992 ... 1995. The other subvolumes are in preparation. In the tables all thermotropic one-component liquid crystals are included. Data for lyotropic liquid crystals, liquid crystal mixtures and statistic copolymers are not included.

Data presented: Data are given for

- liquid crystals (compounds with proven thermotropic liquid crystalline properties)
- non liquid crystals with mesogenic structures (chiral dopants, dyes, mesogenic compounds studied with no liquid crystal properties, compounds not yet studied, basic structures for liquid crystals)

Compiled for each compound are the solid-solid transition temperatures, the liquid crystalline transition temperatures, the heats of transition.

Arrangement of the data: The subvolumes a ... f contain the following groups of monomeric calamitic liquid crystals:

Subvolume a: one-ring systems, two-ring systems without bridging groups.

Subvolume b: two-ring systems with bridging groups.

Subvolume c: three-ring systems with bridging groups.

Subvolume d: three-ring systems with one bridging group.

Subvolume e: three-ring systems with two bridging groups.

Subvolume f: four ring systems, five rings systems, and more than five rings.

The subvolumes g ... j will contain: Metallomesogens, acyclic compounds, acids, steroids. Other monomeric liquid crystals (discotic liquid crystals, polyols/sugars, salts). Polymers (monophilic side group polymers, amphiphilic side group polymers, main chain polymers, natural polymers, elastomers, other polymers).

low frequency properties of dielectric crystals

Chapters in III/1, III/2, III/11, III/18, volume III/29a,b.

Contents of the volumes: Several volumes deal with low and high frequency properties of dielectric crystals. Volumes III/1 and III/2 are out of print and will not be considered here. A revised and extended edition of these volumes are volume III/11 (published in 1979) and its supplement III/18 (published in 1984). Both volumes have again replaced by a revised edition split into the volumes III/29 (published in 1992/93) and III/30 (to be published).

Volume III/29 contains in two subvolumes the low-frequency properties of dielectric crystals. The second order and third- and higher-order elastic constants are dealt with in subvolume III/29a. Subvolume III/29b covers in two chapters piezoelectric, electrostrictive, dielectric

constants, and electromechanical coupling factors of piezoelectric crystals (chapter 3) and pyroelectric coefficients (chapter 4). These chapters are arranged in the same way as chapters 3 and 4 in volumes III/11 and III/18.

Data presented: Piezoelectric constants and its temperature coefficients, electrostrictive constants, dielectric constants and its temperature coefficient, pyroelectric coefficients.

Arrangement of the data: The data for piezoelectric constants are arranged in separate sections for various crystal systems (cubic, hexagonal, trigonal, etc.) and within these tables in subsections on electromechanical coupling factors, piezoelectric strain coefficients, piezoelectric stress coefficients. Two further chapters deal with electrostrictive and with pyroelectric coefficients.

An index of substances (element systems, names) is provided at the end of the volume III/29b.

luminescence of organic substances

Topic of volume II/3.

Contents of the volume: This volume covers the field of luminescence in organic substances mainly by intra-molecular electronic transitions. Most of the substances shown in the tables are not only in the pure condensed state (liquid or solid) but diluted in several solvents as well.

Volume II/3 has been published in 1967.

Data presented: Absorption, emission, decay time, quantum efficiency, fluorescence spectra, phosphorescence spectra, luminescence spectra, luminescence centers (vibrational modes, quantum efficiency, degree of polarization etc.), intermolecular processes in the excited state, quenching of fluorescence, energy transfer, sensitized fluorescence, scintillation technique, influence of radiation damage.

Arrangement of the data: The most important data are assembled in a "main table" (absorption, emission, decay time, quantum efficiency and further information on fluorescence and phosphorescence) This table contains only magnitudes which are known with sufficient reliability. All other information on luminescence etc. follows in special chapters.

An index of substances is provided.

Topic of volumes III/19i1 and i2.

Contents of the volumes: Subvolume III/19i1 deals with the magnetic properties of soft magnetic alloys which are the subject of investigation in relation with their potential usefulness for technical application. The large fields of high-induction alloys and Invar and Elinvar alloys are covered. Subvolume III/19i2 covers the magnetic properties of hard magnetic alloys for permanent magnets. The large field of both the well known magnets based on 3d elements and the currently widely investigated alloys based on rare earth elements are covered.

The relation between magnetic properties and the various preparation techniques of the alloys with the consequences for their physical structure have been obtained special attention.

The subvolumes have been published in 1992 and 1994, respectively.

Data presented:

Soft magnetic alloys: high-purity iron and low-carbon steels, crystalline Fe-Si, Fe-Al, and Fe-Si-Al alloys, application-oriented amorphous ferromagnetic alloys, Invar and Elinvar alloys.

Hard magnetic alloys: magnet alloys based on 3d elements, rare earth-3d magnet alloys, Nd₂Fe₁₄B-type magnet alloys, R₂Fe₁₄C-type magnet alloys. rare-earth-iron interstitial compounds.

Indexes have not been provided.

magnetic properties of nonmetallic compounds

Topic of volumes III/4, III/12, III/27.

Contents of the volumes: In 1970 the two subvolumes of volume III/4 on magnetic and other properties of oxides and related compounds have been published. This volume was thought as a revision of a part of volume II/9 of the 6th Edition. It contained crystallographical and magnetic data for all substances included; the optical, electrical and technological data were also given for most of them, when of special importance and not contained in other volumes of the series. In 1978, 1980 and 1982 three parts of a supplement and extension volume III/12 followed taking account of the rapid progress in this field.

Since 1988 a new revised and extended series of subvolumes is in publication. The new volume III/27 will cover all nonmetallic inorganic substances based on transition elements. The series of subvolumes will comprise 13 subvolumes, presenting - together with the 13 subvolumes of volume III/19 on magnetic

properties of metals - a complete review of magnetic properties of inorganic matter. Eleven subvolumes have been published till the end of 1997, the other subvolumes are in preparation.

Data presented: The volumes contain data on almost all relevant properties of nonmetals as: Magnetic properties: ferro- and ferrimagnetic Curie temperatures, paramagnetic Curie temperature, Weiss temperature, exchange energy, para- and ferromagnetic resonance, g-factor, hyperfine fields, isomer shift, magneto-optical Kerr effect, magnetic moment, magnetic order, magnetic phase diagrams and transition temperatures, magnetic structure, magnetic susceptibility, magnetization, magnetocrystalline anisotropy, magnetostriction coefficient, Néel temperature, spin wave data, type of magnetism, spin glass freezing and transition temperatures etc.

Structural and electronic properties: bulk modulus, elastic constants, lattice parameters, phase diagrams, thermal expansion; band structure, electron density of states etc.

Other properties: electrical conductivity, superconducting transition temperatures, dielectric constants, transport properties as magnetoresistivity, Seebeck and Hall coefficients, thermoelectric power, thermodynamic properties as heat capacities, Debye temperature, Mössbauer spectroscopy data, nuclear magnetic resonance data, spin lattice relaxation time, Knight shift, neutron diffraction results and many others.

Arrangement of the data: The data have been ordered in substance groups which are distributed on the various subvolumes as follows:

Volume III/4:

Subvolume a: Fe oxides and Fe-Me-O compound systems (except ferrites, garnets and perovskites), compounds with lanthanide and actinide elements of some special structure (except garnets and perovskites), perovskites, yttrium and rare earth iron garnets.

Subvolume b: Non-iron garnets, spinels, hexagonal ferrites

Volume III/12: Subvolume a: Garnets, perovskites. Subvolume b: Fe oxides and Fe-Me-O compounds, spinels. Subvolume c: Hexagonal ferrites, special lanthanide and actinide compounds.

Volume III/27:

Subvolume a: Pnictides and chalcogenides based on 3d transition elements.

Subvolume b: Pnictides and chalcogenides based on rare earth and actinide elements (to be published).

Subvolume c: Binary oxides of rare earth and actinide elements (to be published).

Subvolume d: Binary, iron and non-iron oxy-spinels.

Subvolume e: Iron and non-iron garnets.

Subvolume f1: Perovskite-type oxides (based on 3d, 4d, 5d elements, other oxides) (to be published).

Subvolume f2: Perovskite-type layered cuprates (high T_c superconductors and related compounds).

Subvolume f3: Perovskite-type oxides RMO_3 (R = rare earth, M = 3d element or Al).

Subvolume g: Binary oxides of d transition elements, oxides with rutile and pyrochlore structure, hexagonal ferrites, RFe_2O_4 compounds.

Subvolume h: Crystalline boron containing oxide compounds, boracites $\text{M}_3\text{B}_7\text{O}_{13}\text{X}$ and related compounds.

Subvolume i: Silicates (to be published).

Subvolume j1: Halides (compounds of the type MX_2 , $\text{M}_{1-x}\text{M}'_x\text{X}_2$, MX_3 , $\text{MCl}_2\text{-GIC}$, $\text{MCl}_3\text{-GIC}$, $\text{MM}'\text{F}_5$, $\text{M}, \text{M}' = 3d \text{ element}$, $\text{X} = \text{halogen element}$).

Subvolume j2: Further halides.

Each section for a certain substance group begins with a survey about the substances and properties dealt with in the section.

Volumes III/4b and III/12c contain indexes of substances (for III/4a,b and for III/4a,b,12a,b,c, respectively).

magnetic susceptibility of coordination and organometallic transition metal compounds

Chapter in volumes II/2, II/8, II/10, II/11, II/12a.

Contents of the volumes: The volumes contain a chapter with data on magnetic susceptibilities and another chapter with results from electron paramagnetic resonance of coordination and organometallic compounds. For purpose of comparison some other compounds have also been included. Volumes II/8, 10, 11, 12 (published

1976, 1979, 1981 and 1984, respectively) are supplements to volume II/4 (published 1966).

Data presented: Susceptibility, Curie constant, magnetic moment, transition temperature (paramagnetic Curie temperature, Weiss temperature).

Arrangement of the data: All volumes contain an extensive introduction providing the theoretical basis, selected diamagnetic ionic susceptibilities, Pascal constants, one-electron spin-orbit coupling constants, average magnetic moments as function of temperature, spin-orbit coupling etc.

The data on susceptibilities and on EPR are presented in distinct parts of each volume (in volume II/12 in parts II/12a and II/12b).

The compounds are listed under the appropriate transition metal ion or atom. The different ions of a particular transition group element are ordered by their oxidation numbers. The group of substances following from that subdivision is arranged into following order: (1) Simple compounds and coordination compounds with simple anionic ligands, (2) coordination compounds with neutral or chelating ligands, organometallic compounds, biological compounds. To each experimental value the experimental method is given.

meteorology

Topic of volume V/4.

Contents of the volume: Volume V/4 covers meteorological data as thermodynamical and dynamical structures of the global atmosphere (subvolume a), physical and chemical properties of air (subvolume b), and climatology

(subvolumes c1 and c2). In some areas it was inevitable to reserve a lot of space for explaining text and theoretical background which is important for understanding atmospheric processes.

The subvolumes were published in 1987/89.

Data presented: Spherical, generalized horizontal and vertical coordinates, thermodynamic data for dry and moist air (humidity, density), gravity, wind, clouds, solar radiation, refractive index of air, attenuation of light in the atmosphere, skylight, twilight, visibility of air, aureole, corona, rainbow, glory, halos, electrical conductivity of air, lightning, thunder, aerosols (physical and chemical properties), chemical composition of the air, climate definition, variation and models.

Arrangement of the data: The data have been arranged in following chapters:

Subvolume a: Equations and principles of atmospheric large-scale dynamics, data for the basic structure of the atmosphere, the observed general circulation of the atmosphere, meteorological organizations.

Subvolume b: Cloud physics, atmospheric radiation, meteorological optics and radiometeorology, atmospheric electricity, aerosol physics and chemistry, chemical composition of the atmosphere.

Subvolumes c1 and c2: Climate definition, climate models, the present global climate, specific surface climates, climate variations, the planetary boundary layer.

molecular acoustics

Topic of volume II/5.

Contents of the volume: This volume contains those data on acoustics which are based essentially on the molecular properties of matter. The volume has been published in 1967.

Data presented: Sound and ultrasound velocity as function of pressure, temperature and frequency, dispersion and absorption in gases, liquids and isotropic or quasi-isotropic solids (absorption coefficient as function of pressure, temperature and frequency), propagation of shock waves (velocity).

Arrangement of the data: The data are arranged into chapters on

- sound velocity in pure gases, vapors and (inorganic and organic) liquids, in mixtures of gases, of liquids and of aqueous and non-aqueous solutions,
- sound absorption and dispersion in gases, liquids, mixtures and solutions,
- sound propagation in liquid helium, in isotropic or quasi-isotropic solids (inorganic and organic solids, high polymers),
- velocity of shock waves.

An index of substances for elements and inorganic compounds, for organic compounds, and for solutions and mixtures is provided. It includes for each substance references to the main parameters tabulated in the volume.

molecular constants (mostly from microwave, molecular beam and related measurements)

Topic of chapters of volumes II/4,6,14,19.

Contents of the chapters: The volumes contain a chapter (in all volumes designated as chapter 2) with data on properties of diamagnetic molecules obtained from microwave and molecular beam measurements, esr- and sub-Doppler laser spectroscopy. While volume II/4 present data published up to 1965 the following supplements and extensions cover the literature up to 1974 (II/6), 1982 (II/14a,b), 1989/90 (II/19a,b,c,d1,d2, d3).

For data on molecules in non- $^1\Sigma$ -electronic states contained in another chapter of these volumes see below under "**radicals: molecular constants**".

Data presented: Data are given for the following properties of diamagnetic molecules: Diatomic molecules: Rotational constants, centrifugal distortion constants, rotation-vibration interaction constants, Dunham energy parameters and potential coefficients, parameters of the breakdown of the Born-Oppenheimer approximation and of the nuclear field shift, and equilibrium internuclear distances, dipole moments, quadrupole coupling constants, magnetic constants (spin-rotational constants, nuclear spin-spin coupling constants, rotational g-factors, magnetic susceptibilities, magnetic shielding constants, molecular quadrupole moments).

Linear molecules: Rotational constants, centrifugal distortion constants, rotation-vibration interaction constants, l-type doubling constants, and references for structural data, dipole moments, quadrupole coupling constants, magnetic constants (rotational g-values, magnetic susceptibilities, magnetic anisotropies, paramagnetic and diamagnetic contributions, molecular quadrupole moments, electronic charge distributions, spin-rotation and spin-spin coupling parameters, nuclear g-values from the rotational Zeeman effect, nuclear shielding parameters from the rotational Zeeman effect).

Symmetric top molecules: Rotational constants, centrifugal distortion constants, rotation-vibration interaction constants, l-type doubling constants, and Coriolis coupling constants, dipole moments, quadrupole coupling constants, magnetic constants (see linear molecules, above).

Asymmetric top molecules: Rotational constants, centrifugal distortion constants, rotation-vibration interaction constants, Coriolis coupling constants, equilibrium structure, and references for structural data, dipole moments, quadrupole coupling constants, magnetic constants (see linear molecules, above)

Furthermore, data on hindered rotation are given for C-X bonds (X = C, Si, Ge, Sn, N, P, As, O, S, Se)

Arrangement of the data: All chapters on constants of diamagnetic molecules are arranged in the same way:

Survey, diatomic molecules, linear molecules, symmetric top molecules, asymmetric top molecules, dipole moments, quadrupole coupling constants, hindered rotation, magnetic constants.

All volumes or last subvolumes (II/4, 6, 14b, 19d3) contain an Index of Substances covering the respective volume and all volumes published previously. The full index of all nine subvolumes II/4, 6, 14a, 14b, 19a, 19b, 19c, 19d1, 19d2 has been published as subvolume II/19d3. It contains gross and structure formulae and CA-Registry numbers for all molecules together with the references to subvolumes, section and substance numbers.

molecular constants (mostly from infrared spectroscopy)

Topic of volume II/20.

Contents of the volume: The volume presents in a series of subvolumes spectroscopic data about molecular constants obtained by Fourier transform interferometers and infrared lasers. These data have been analysed and accurate molecular parameters determined.

Three subvolumes (b1,b2 α ,b2 β) have been published up to summer 1997, four further subvolumes are in preparation:

Subvolume a: diatomic molecules

Subvolume b: linear triatomic molecules (b1: BCIH⁺ ... COSe, b2: CO₂, b3: CS₂ ... N₃)

Subvolume c: nonlinear triatomic molecules

Subvolume d: polyatomic molecules.

Data presented: Molecular and vibrational constants, rotational constants, spin-orbit interaction constants, centrifugal distortion constant, vibration-rotation constants, anharmonicity constants and many others, dipole moments, Renner-Teller parameter, Herman-Wallis factor etc.

Arrangement of the data: An extensive introduction reports molecular theories and equations based on which most of the evaluated data are established. Tables containing the critically revised data follow. In order to keep their consistence and their optimum ability to reproduce data, molecular constants are reported when possible from the same calculation of a given set of measurements.

nuclear magnetic resonance data

Topic of volume III/35

Contents of the volume: This volume provides a comprehensive and evaluated compilation of nuclear magnetic resonance data. Subvolume a has been published in 1997; three further subvolumes are in preparation.

Contents: Chemical shifts and coupling constants of boron-11 and phosphorus-31 are presented in subvolume a. The following subvolumes will contain data on fluorine-19, nitrogen-15, and oxygen-17, hydrogen-1 and carbon-13 compounds. The data are tabulated together with gross- and structure formulae and the most readily available solvents. The temperature or pH dependence, if reported in the original literature, is also indicated.

Arrangement of the data: Due to the large amount of the data merely the chemical shifts are presented in the printed version, and all the data, chemical shifts and coupling constants are provided on a CD-ROM.

nuclear quadrupole resonance spectroscopy

Topic of volumes III/20, III/31.

Contents of the volumes: The data collection in these volumes is confined to the nuclear quadrupole resonance frequencies and other important parameters which were determined by typical magnetic resonance methods such as NQR, NMR, ESR (EPR), and a few other special techniques. Data on liquid crystals and other non-crystalline materials were also included if measured by use of those techniques.

The volumes III/20a,b,c cover the literature up to 1982, the supplements III/31a,b add data published up to the end of 1989.

Data presented:

- One chapter contains tables of nuclear and atomic properties relevant to the quadrupole interaction, i.e. spin, NMR frequency at 1 T, natural abundance, magnetic moment, electric quadrupole moment, ratio of electric quadrupole moments for different nuclides, values of $\langle (a_0/r)^3 \rangle$ for the valence state of neutral atoms, atomic quadrupole coupling constant, Sternheimer antishielding coefficient, NQR frequency between different quadrupole energy levels, and eigenvalues for the nuclear quadrupole states for spins $I = 5/2, 7/2, \text{ and } 9/2$.
- The next chapter contains the tables of NQR resonance frequencies, nuclear quadrupole coupling constants, asymmetry parameter values, and other information of interest about the substances.
- Graphical data are presented in the following chapter for the cases where no numeric values of resonance frequencies are reported in the original literature.

Arrangement of the data: The tables on NQR resonance frequencies are arranged in the order of increasing atomic number of the nucleus for which the NQR frequencies are reported. Within a table the chemical substances are arranged in alphanumeric order of the gross molecular formula according to the Hill system.

Indexes are provided in subvolumes III/20c and III/31b. They include an index of gross molecular formulae, an index of chemical substance names, and an index of CAS Registry Numbers.

nuclear radii

Topic of volume I/2.

Contents of the volume: The volume contains nuclear radii and other characteristic parameters of atomic nuclei deduced from electron scattering experiments and from the observation of mesic X-rays. The volume has been published in 1967.

Data presented: Nuclear charge distribution derives from sources other than electron scattering: energy levels of μ -mesic atoms for spherical nuclei (equivalent uniform radius parameter), neighbouring atoms (optical, μ -mesic and X-ray isotope shifts, nuclear compressibility, parameters for deformed nuclei, radii of isomers).

Nuclear radii determined by electron scattering: electric charge radii, nuclear charge density functions and form factors, magnetic radii (radii of the distribution of the magnetic moment).

Arrangement of the data: The volume contains two chapters for the parameters listed above.

nucleic acids

Topic of volume VII/1.

Contents of the volume: The volume concentrates on those aspects of the large field of nucleic acids and its constituents, which are of main importance in structure, spectroscopy, thermodynamics, kinetics, and theory. Due to the amount of data four subvolumes (VII/1a,b,c,d) have been published in 1989/90.

Data presented: Crystal structure of bases, nucleosides, nucleotides, oligonucleotides, tRNAs, DNA and RNA helices in oriented fibers, drug-oligonucleotide complexes, hydrogen bonding in crystal structures of nucleic acid components.

Spectroscopic and kinetic data circular dichroism spectra, melting temperatures of polynucleotide complexes, Raman spectra, infrared spectra, nuclear magnetic resonance data of

oligonucleotides, chemical shift in tRNA, thermodynamic parameters.

Bending and torsional rigidity of double helices, calorimetric data, solution properties of DNA, data for supercoiled and circular DNA, viroids and viroid-like RNAs etc.

Arrangement of the data: Subvolumes VII/1a and VII/1b deal with crystallographic and structural data, subvolume VII/1c with spectroscopic and kinetic data, as well as with physical data for nucleic acids and their constituents; subvolume VII/1d continues the presentation of physical data and informs about theoretical investigations.

oceanography

Topic of volume V/3.

Contents of the volume: The volume covers the field of physical oceanography. It has proved to be necessary to include more explanatory text and more formulas than have been necessary in volume dealing with more developed areas of physical sciences. The volume revises a respective chapter in volume III of the 6th Edition.

Three subvolumes of volume V/3 (a,b,c) have been published in 1986, 1989 and 1986, respectively.

Data presented: Topography, hypsography and bathymetry of the ocean floor, sedimentation, physical properties of sea water (salinity, density, compressibility, thermal expansion, specific heat, vapour pressure, boiling point, freezing point, heat of fusion and evaporation, thermal conductivity, diffusion, viscosity, surface tension, osmotic pressure, sound velocity, sound absorption and transmission, optical properties, chemical properties), ocean circulation, salinity, turbulence, waves (surface waves, internal gravity waves), tides, upwelling regions, sea ice (density, porosity, salinity, specific heat capacity, heat of fusion, thermal conductivity, elastic properties, strength), coasts (classification, shore, wave effects, tide effects, estuaries, lagoons) etc.

Arrangement of the data: The data are arranged in the three subvolumes as follows:

Subvolume a: Topography of the ocean floor, in-situ instruments and measurement techniques, properties of sea water.

Subvolume b: Ocean circulation and turbulence.

Subvolume c: Ocean waves, upwelling regions, ice in the ocean, coastal oceanography.

optical properties

Topic of volume III/38.

Contents of the volume: The volume will cover optical properties of solids and liquids.

Data presented: In the first two parts of volume III/38 - which were published in 1996 - critically evaluated data on refractive indices of inorganic and organic liquids and their wavelength dependence (dispersion) are provided. Subvolume a contains the inorganic, organometallic, and organononmetallic liquids, and the binary liquid mixtures (about 900 pure substances and their mixtures). Subvolume b contains data of more than 7600 organic liquids.

Arrangement of data: Since not all data for the organic compounds and mixtures could be included in the printed version the second subvolume additionally contains an electronic version of the complete collection with all available data and references.

optical properties of pure metals and binary alloys

Chapter in volume III/15, subvolume b.

Contents of the chapter: The chapter contains optical properties caused by the free electron gas of the metals. Volume III/15b was published in 1985.

Data presented: Drude parameters (plasma frequency, effective electron mass, relaxation time).

Optical constants (real and imaginary part of the dielectric function, refractive index and absorption coefficient (real and imaginary parts of the complex refractive index), reflectivity).

The data are mostly room temperature values. Literature covered up to 1979.

Arrangement of the data: The data are presented in chapter 4 of subvolume III/15b separate for pure metals (sections 4.1 ... 4.4) and for dilute alloys (sections 4.5 ...4.8).

phase diagrams and physical properties of nonequilibrium alloys

Topic of volume III/37.

Contents of the volume: Metallic amorphous materials are of high strength, high corrosion resistance, high permeability and other industrially important and useful properties. Furthermore, new metallic materials can be produced from metallic amorphous materials by proper crystallization processes, usually heat treatment, to meet the various industrial demands.

Data presented: The first subvolume A - published in 1997 - presents data on nonequilibrium phase diagrams of ternary amorphous alloys

Arrangement of the data: Preparation methods, atmosphere for preparation of amorphous alloys, sample form and size and phase identification methods are provided. Composition data are given in phase diagrams and tables.

phonon states in metals

Chapters in volumes III/13a,b.

Contents of the chapters: Volume III/13 contains in two of its three subvolumes chapters about phonon dispersion, frequency spectra and related properties of metallic elements, compounds and disordered alloys.

Subvolumes a and b have been published in 1981 and 1983, respectively.

Data presented: Metallic elements: Phonon dispersion: method, phonon frequencies and dispersion curves, anomalies in the dispersion curves, anharmonicity (mode Grüneisen parameter), Born-von Karman parameter.

Frequency spectra and related properties: phonon density of states as function of frequency, Debye cutoff frequency, lattice specific heat, Debye temperature, Debye-Waller factor.

Theoretical models: Born-von Karman model, pseudopotential models etc. (comments and references only).

Metallic compounds and disordered alloys: Experimental and theoretical phonon dispersion curves, calculated one-phonon density of states for NaCl-structure compounds, Cu₃Au-structure compounds, bronzes, Laves phases, Chevrel phases, miscellaneous, linear conductors, hydrogen in metals, disordered alloys.

Both subvolumes contain an introduction to the theoretical basics.

Arrangement of the data: The data for metallic elements are contained in chapter 1 of subvolume III/13a, the data on metallic compounds and disordered alloys in chapter 4 of subvolume III/13b. Dispersion curves and densities of states have been given in figures and in tables.

No index of substances is provided. Most chapters contain at the beginning a survey about all substances dealt with in the chapter.

photoemission spectra of solids

Topic of volume III/23.

Contents of the volume: The volume contains a critical and as comprehensive as possible tabulation of electronic structure information obtained by electron and photon spectroscopies. Besides photoelectron results, also a limited set of other data (like lattice constants and work functions) useful in the context of band structure information has been presented.

Subvolume III/23a has been published in 1989, subvolume III/23b in 1994, subvolume III/23c is in preparation.

Data presented: Crystal structure, electron configuration, work function, plasmon energies, core level binding energies, valence band critical point energies, angle-integrated and angle-resolved valence band and core level spectra, calculated band structures and densities of state.

Arrangement of the data: The data have been arranged in sections for substance groups, and within the sections in subsections for single substances. For each substances the data listed above are given.

Substance groups are: Subvolume a: Tetrahedrally bonded semiconductors, alkali halides, condensed molecules, sp-metals, lanthanides.

Subvolume b: Transition metal compounds, layered compounds, actinides and some of their alloys and compounds.

Subvolume c: Noble metals, noble metal halides, non-magnetic transition metals, magnetic transition metals and some of their alloys, solid rare gases.

physics of solid surfaces

Topic of volume III/24.

Contents of the volume: Volume III/24 is concerned with the physics of clean solid surfaces, i.e. to surfaces atomically clean and well characterized, leaving off the more complex field of the contaminated surfaces and overlayers.

The volume is subdivided into four subvolumes. The first two are concerned with the properties of clean surfaces (structural, electronic, vibrational, magnetic) irrespective of the method of investigation, while the last two deal with results that are proper to a specific technique.

Subvolumes III/24a, III/24b, III/24c and III/24d have been published 1993, 1994, 1995 and 1996, respectively.

Data presented: The chapters of volume III/24 contain the following informations:

Structure: ideal surfaces, lattice parameters; surface reconstruction, surface relaxation, surface symmetries, change of interlayer distance, vertical and lateral displacement of single atoms, coordinates of atoms or adatoms, buckling parameters, tilt angles; structural defects at surfaces.

Electronic structure: work function, surface core level shifts, surface band structure, photoemission spectra, surface states.

Vibrational and excitational properties: surface phonons (dispersion curves), surface polaritons.

Magnetic properties: magnetic moments of surface atoms, magnetic ordering,, magnetic hyperfine fields near surfaces, live layers, magnetic surface anisotropies.

Interaction of charged particles with surfaces: elastic scattering and diffraction of electrons and positrons, inelastic scattering of electrons, elastic and inelastic scattering of ions.

Interaction of atoms with surfaces: elastic and inelastic scattering of atoms (mainly He) with thermal energies.

Interaction of electromagnetic radiation with surfaces: optical properties of surfaces (reflectivity, ellipsometry, surface photoconductivity, photoluminescence, photovoltage spectroscopy, photothermal displacement, second harmonic generation), photoemission and inverse photoemission, X-ray diffraction at surfaces.

Electron tunneling at surfaces: field emission, field ionization, field desorption (work function, activation energies for self-diffusion and diffusion of foreign atoms), scanning tunneling microscopy.

Arrangement of the data: The data are presented in chapters as listed above. Each chapter consists of an introduction, a compilation of data (tables and figures), bibliography. The introduction reviews the problems of the specific field and presents all theoretical and methodical information necessary for an understanding of the data.

In a general introduction the contents of all chapters are briefly introduced. A list of crystal structures and bulk lattice parameters of all substances quoted in the volume is provided.

Subvolume III/23a contains the chapter on surface structure, subvolume III/23b the chapters on electronic, vibrational and magnetic properties. Subvolume III/23c contains the chapters on the interaction of charged particles and atoms with surfaces, and the last subvolume III/23d deals with the interaction of radiation with surfaces and electron tunneling.

preparation dependent magnetic properties of metals

Topic of volumes III/19g, h.

Contents of the volumes: The two subvolumes contain data for metallic compounds, which contain at least one transition element: In subvolume III/19g magnetic properties are given for several major types of crystalline and amorphous thin magnetic films that are supported by a substrate. Those films have been considered for which a more or less coherent group of data is available. Subvolume III/19h contains data on liquid quenched and sputtered alloys.

The subvolumes have been published in 1988 and 1991, respectively.

Data presented: Thin films: surfaces, interfaces and ultrathin films (surface magnetization, monolayer magnetization, surface hyperfine interaction, live layers, magnetic surface anisotropies), crystalline films of 3d transition elements and of alloys between these elements (sputtered and evaporated films, structure, preparation, magnetization, coercivity, magnetic anisotropy), crystalline and amorphous films with rare earth and 3d elements (structure, Mössbauer spectroscopy, magnetization, exchange constants, magnetic anisotropy, magnetostriction, coercivity, bubble parameters, ferromagnetic resonance and spin waves, magneto-optical properties, magnetoresistance, Hall effect), thin film sandwiches (magnetic properties of multilayered and superlattice films).

Liquid quenched and sputtered alloys: magnetic properties of alloys of 3d elements and main group elements as well as 3d elements and rare earth elements (paramagnetic properties, magnetic moments, saturation magnetization, Curie temperature, magnetic phase diagrams etc.)

Arrangement of the data: Arrangement according to substance groups, presentation of the data in tables and figures (surveys at the beginning of chapters), no indexes.

production of radionuclides at intermediate energies

Topic of volume I/13.

Contents of the volume: This volume continues the systematic presentation of production cross sections of volume I/5. The subvolumes of volume I/13 present precise production cross sections for specific radionuclides for medium energies (10 MeV ... 100 GeV) of different incident particles, e.g. protons, antiprotons, pions, deuterons, tritons, and ^3He -nuclei.

The first subvolume I/13a has been published in 1991. Till the end of 1997 seven subvolumes (b ... h) followed.

Data presented: Excitation functions (cross sections as function of kinetic energy of the incident particle, given in tables and separately as plots). For the interactions of pions and antiprotons with nuclei also: isotope yields.

Arrangement of the data: The subvolumes, published up to the end of 1997 contain: Interactions of protons with targets from He to Br (subvolume a), from Kr to Te (subvolume b), from I to Am (subvolume c), supplementary data to subvolumes a ... c (subvolume d), interaction of pions and antiprotons with nuclei (subvolume e), interactions of deuterons, tritons and ^3He -nuclei with nuclei (subvolume f), interaction of α -particles with targets from He to Rb (subvolume g) and from Sr to Cf (subvolume h).

radical reaction rates in liquids

Topic of volumes II/13, II/18.

Contents of the volumes:

The volumes present rate constants and other kinetic data of free radical reactions in liquids. Emphasis is on polyatomic organic free radicals, biradicals are included. The subvolumes of volume II/13 cover the literature up to 1982. Volume II/18 supplements the literature up to 1992. Five subvolumes (18a,b,c,d1,d2) have been published up to the end of 1997.

Data presented:

Rate constants of uni- and bimolecular processes, equilibrium constants, Arrhenius activation parameters (if available), also enthalpies, entropies and volumes of activation. For acid-base equilibrium pK-values are also listed. All data are given together with information about radical generation, method, solvent and reference.

Arrangement of the data:

The subvolumes of II/13 are arranged in chapters on specific groups of radicals:

Subvolume a: 1. Carbon-centered radicals: radical-radical reactions, 2. Carbon-centered radicals: radical molecule-addition reactions, 3. Carbon-centered radicals: fragmentation and rearrangement reactions.

Subvolume b: 4. Carbon-centered radicals II.

Subvolume c: 5. Nitrogen-centered radicals, 6. Aminoxyl and related radicals, 7. Radicals centered on S-, P- and other heteroatoms.

Subvolume d: 8. Oxy-, peroxy- and related radicals (to be published).

Subvolume e: 9. Proton transfer reactions and equilibria of radicals, 10. Electron transfer equilibria involving radicals and radical ions in aqueous solutions, 11. Biradicals (to be published).

The subvolumes of II/18 are similarly arranged:

Subvolume a: Carbon-centered radicals I.

Subvolume b: Carbon-centered radicals II.

Subvolume c: Nitrogen-centered radicals, aminoxyls and related radicals.

Subvolume d1: Alkoxyl, carbonyloxyl, phenoxyl, and related radicals.

Subvolume d2: Peroxyl and related radicals.

The two planned further subvolumes cover: Radicals centered on other heteroatoms. Proton transfer equilibria (e1) and Biradicals. Radicals in excited states. Carbenes and related species (e2).

radicals: magnetic properties of free radicals

Topic of volumes II/1, II/9, II/17.

Contents of the volumes: The radicals considered in these volumes are (chemically stable or transient) paramagnetic atoms, molecules and ions which derive their paramagnetism from a single unpaired s- or p-electron. Volume II/1 covers the literature up to 1964, the subvolumes of volume II/9 supplement these data up to 1975/6. The subvolumes of II/17 cover the period 1977 ... 1980.

Data presented:

The tables give the spin Hamiltonian parameters g (spectroscopic splitting tensor) and a_k (elements of the hyperfine coupling tensor). For each radical structure, gross formula, generation of radical, matrix or solvent, measuring method and references are given.

Arrangement of the data: The groups of radicals covered in the sixteen subvolumes of volumes II/1, II/9 and II/17 are arranged in the same order given in the following for volume II/17 (the respective chapters in II/1 and II/9 deviate only slightly from this order):

1 Inorganic radicals and radical ions.

2 Radicals in metal complexes.

3 Nonconjugated carbon radicals.

4 Carbon radicals with conjugated π -systems.

5/6. Nitrogen radicals.

7 Oxy- and peroxy-alkyl radicals.

8 Aroxyl radicals.

9 P-centered and related radicals.

10 S- and Se-centered radicals.

11 Organic radicals centered on other heteroatoms and related radical ions.

12 Hydrocarbon and substituted hydrocarbon anion radicals.

13 Anion radicals from heterocyclic compounds

14 Anion radicals from organoboron compounds.

15 Anion radicals from from nitro and nitroso compounds.

16 Semidiones and related species.

17 Semiquinones and related species.

18 C-O and halogen-centered organic cation radicals.

19 Cation radicals of aromatic of aromatic hydrocarbons and their derivatives and S-heterocycles.

20 Cation radicals from nitrogen containing compounds.

21 Organic C-, O-, and N-centered bi- and polyradicals.

22 Organic bis- and poly nitroxides.

radicals: molecular constants

Chapters in volumes II/6,14, subvolumes II/19d1,d2.

Contents of the chapters: Some of the volumes on molecular constants contain chapters on radicals, defined as molecules in non- 1Σ electronic states: volume II/6 (chapter 5) and volume II/14b (chapter 4). Two subvolumes of II/19 are devoted to radical only.

Data presented: The analysis of the spectrum of a radical is performed by calculating the energy eigenvalues of the corresponding Hamiltonian. A formal description of the Hamiltonian necessary to describe the rotational energy and the fine and hyperfine structure in the molecular non- 1Σ states is given in section 5.1.1 of volume II/6. The tables of II/6, II/14b and II/19d1,d2 contain data on excited states of diatomic radicals ($^2\Sigma$, $^3\Sigma$, $^1\Pi$, $^2\Pi$, $^3\Pi$, $^1\Delta$) and of linear and non-linear polyatomic radicals. The most important parameters tabulated are:

Diatomic radicals: rotational constant of the vibrational state. centrifugal distortion constant, ρ -type doubling frequency, spin-rotation interaction constant, centrifugal distortion constant, magnetic hyperfine

constants, electric quadrupole interaction constant, molecular electric dipole moment, g-factor from electron spin.

Polyatomic radicals: rotational constants, centrifugal distortion constants, electronic spin dipolar parameters, electronic spin-rotation parameters, nuclear magnetic hyperfine parameter, nuclear electric quadrupole coupling parameters, electron spin g-tensor, rotation g-tensor.

Arrangement of the data:

For diatomic radicals all molecules for one specific electronic state are collected in a separate subsection. Within these subsections, the radicals are arranged according to the number of valence electrons and in increasing order of atomic number. For polyatomic radicals sections for linear polyatomic, non-linear triatomic and non-linear polyatomic radicals are provided. All radicals dealt with are collected in the List of Substances in volume II/19d3.

reaction energies and excitation functions of nuclear reactions

Topic of volume I/5.

Contents of the volume: Volume I/5 presents in its subvolume I/5a data on reaction energies (Q-values) of nuclear reactions. In the following subvolumes I/5b and I/5c excitation functions have been compiled. The three subvolumes have been published in 1972, 1973 and 1974, respectively.

For a continuation of this topic see volume I/13 (keyword "production of radionuclides at intermediate energies").

Data presented: Mass excesses, Q-values calculated from experimentally determined mass excesses, relation between threshold energy and Q-value, height of the Coulomb barrier.

Excitation functions for charged-particle induced nuclear reactions, thick target yields for p, d, ^3He and α reactions.

Arrangement of the data: Subvolume I/5a contains Q-values and mass excesses. Subvolume I/5b contains experimentally determined excitation functions for nuclear reactions of charged projectiles (p ... ^{40}Ar) with a great number of target nuclides (^1H ... ^{98}Cf). The excitation functions are presented in graphs which are supplemented by a table with characteristic data. Subvolume I/5c presents a systematics of excitation functions which allow interpretation and extrapolation for cross sections that have not yet been measured.

rocks, physical properties

Topic of volume V/1.

Contents of the volume: This is the first of a series of volumes on geophysical data. It contains data of rock samples measured in the laboratory, i.e. not in-situ (for such data see V/2).

The two subvolumes of V/1 were published in 1982.

Data presented: Data on igneous rocks, metamorphic and sedimentary rocks (mineral and chemical composition etc.), density of minerals and rocks, porosity, capillarity, permeability, elastic wave velocity, constants of elasticity, fracture and flow of rocks and minerals, friction, rheology, creep, thermal conductivity, specific heat, melting temperatures, radioactive heat generation, electrical conductivity of minerals and rocks, dielectric constant of minerals and rocks, dia- and paramagnetic properties, ferromagnetism, ferrimagnetism, antiferromagnetism of minerals, magnetization of rocks, Curie temperature, radioactivity of rocks, age of rocks.

Thermal, electrical, optical and mechanical properties of ice.

Chemical composition, density, porosity, elastic moduli, compressional and shear waves, thermal conductivity, specific heat, thermal expansion, dielectric constant, electric conductivity, ferro-, antiferro- and paramagnetic properties of lunar rocks.

Arrangement of the data: The chapters are arranged according to the various properties: Subvolume a: density, porosity, permeability, thermal properties.

Subvolume b: elasticity, electrical properties, magnetic properties, radioactivity, physical properties of ice, physical properties of lunar rocks.

Both subvolumes contain a common two-dimensional survey of the contents of volume V/1. Subvolume V/1b contains additionally a subject index for both subvolumes.

semiconductors: physical properties

Topic of volumes III/17a, b, c ... i, III/22a,b.

Contents of the volumes: Volume III/17 presents in nine subvolumes data on semiconductors. In volumes a,b,c ... i physical properties are dealt with. Two subvolumes (c,d) contain technological data. Data for all known group of semiconductors have been collected. Subvolumes a,b,e,...h cover all inorganic crystalline semiconductors, subvolume i supplements data on amorphous and on organic semiconductors.

The policy for the selection of data was not to compile only the semiconductor properties of materials but to present all data a semiconductor physicist is looking for. Thus e.g. structural data and information about phase transitions etc. - which can be found more completely in other volumes - have not been omitted but are presented to such an extent as may be expected by the user.

The subvolumes have been published in 1982 ... 1985. The data on the most important groups of semiconductors (group IV elements, III-V-, II-VI-, and I-VII-compounds) have been supplemented and extended in volume III/22a,b (published in 1987/89).

Data presented: The following list shows the organization of a chapter on a group of semiconductors. If only few data were available the subdivision has been restricted or left out.

"0-section":

Presentation of all members of the group, review of general relationships, structure, non-semiconducting phases (or members of the family not being semiconductors), high-pressure phases etc. General discussion of the chemical bond within the group.

The 0-section is followed by separate sections on each member of the group and on solid solutions within the group and with members of other groups. The physical properties are listed - as far as possible - in subsections of the following order:

1. Electronic properties: Information and data about electronic and excitonic energy states as well as electron and hole parameters: band structure, density of states, band gaps, exciton data, spin-orbit splitting energies, intraband and interband energies, effective masses and g-factors of electrons, effective masses of holes, other valence band parameters, deformation potentials.

2. Impurities and defects: Basic data on shallow and deep states, bound excitons and local modes (data on diffusion and distribution coefficients are presented in the volumes on semiconductor technology); shallow donors (ionization energies, excited states ground state splittings, deformation potentials etc.), local modes (energies, isotope shifts etc.), deep traps, 3d transition metals (ionization energies, ESR and ENDOR data etc.)

3. Lattice properties: Static and dynamical properties of the lattice (for structure, phase transitions, chemical bond, see the 0-section of the respective chapter; for density and melting point, see subsection 6; for static dielectric constant, see subsection 5); lattice parameter, thermal expansion, phonon dispersion relations, density of states, phonon frequencies (wavenumbers), sound velocities, elastic moduli (also third order), Young's modulus, torsion modulus, bulk modulus, compressibility, Poisson's ratio, Grüneisen constant, mode Grüneisen parameters, effective ion charge etc.

4. Transport properties: Electronic transport parameters (for thermal conductivity, see subsection 6): conductivity, carrier concentrations, electron and hole mobilities, warm electron coefficient (for hot carrier effects and e-h-drops, see a special chapter in subvolume III/17i), Hall effect and magnetoresistance, piezoresistance, elastoresistance, elaststriction, piezoelectric coefficients etc., other transport parameters as Seebeck coefficient (thermoelectric power), Nernst coefficient etc.

5. Optical properties: Optical spectra, optical constants, parameters obtained from optical experiments (if not already presented in subsections 1 or 2), refractive index, absorption index, absorption coefficient and reflectance, dielectric constant (including static dielectric constant), optical spectra, other optical coefficients (Verdet, two-phonon absorption, piezoelectric coefficients etc.), Raman and Brillouin scattering, electron energy loss, optical spectra including core levels (vacuum uv spectra, yield spectra, ESCA, XPS, UPS, Auger spectra etc.), Schottky barrier heights.

6. Further properties: Thermal, magnetic, thermodynamic properties, some other general data (to avoid too much overlap with other LB-volumes only the most important data have been included), thermal conductivity, magnetic susceptibility, Debye temperature, heat capacity, hardness, melting point, thermodynamical data (characteristic data on fusion, formation, vaporization, entropy etc.).

Besides the topics listed above a few special topics have been dealt with in chapters of subvolume III/17i: space charge layers at surfaces and interfaces, hot electrons, electron-hole liquids.

In the supplement volumes III/22 the arrangement is changed slightly. In III/22a the 0-section as well as "6. Further properties" have been incorporated into the other subsections. Section 2 (Impurities and defects) has completely omitted.

Data on this topic has been collected in subvolume III/22b: Data are presented on properties as solubility and segregation, diffusion constants, shallow defect levels, deep defects and impurities, luminescence data, ESR and ENDOR data, local vibrational modes etc.

Arrangement of the data: The substance groups dealt with in the various subvolumes of III/17 are:

Subvolume a: Group IV elements and IV-IV compounds, III-V compounds.

Subvolume b: II-VI and I-VII compounds, semimagnetic compounds.

Subvolume e: Group III, V, VI elements, binary compounds of the type $IA-IB$, I_xV_y , I_xVI_y , II_xIV_y , II_xV_y , II_xVII_y .

Subvolume f: Binary compounds of the type III_xVI_y , III_xVII_y , IV_xV_y , IV_xVI_y , IV_xVII_y , V_xVI_y , V_xVII_y .

Subvolume g: Boron compounds, binary transition metal compounds, binary rare earth compounds.

Subvolume h: Tetrahedrally bonded ternary and quasi-binary compounds, ternary transition metal compounds, ternary rare earth compounds, further ternary compounds.

Subvolume i: Amorphous semiconductors, organic semiconductors, special topics (space-charge layers at surfaces and interfaces, hot electrons, electron-hole liquids).

Subvolume i contains a comprehensive index for III/17a...i: a substance index for inorganic semiconductors (subvolumes III/17a,b,e...i), an index of binary and quasi-binary phase diagrams (subvolumes III/17a,b,e...i), an index of mineral and common names and an index of organic semiconductors (subvolume III/17i).

Subvolume III/17a furthermore contains an introductory chapter on the theoretical basics for the understanding of the data presented in the various subvolumes.

For technical reasons, the figures of all sections have been collected to form a separate part of each subvolume.

Subvolume III/22a supplements subvolumes III/17a,b by providing data on group IV elements, and III-V, II-VI, and I-VII compounds.

Subvolume III/22b is devoted to "Impurities and defects in group IV elements and III-V compounds". This subvolume contains a theoretical chapter (trends of impurity and defect properties) and a Subject Index.

semiconductors: technological data

Topic of volumes III/17c,d.

Content of the volumes: Two subvolumes of technological data have been included into the series of subvolumes of III/17a...i (see topic G14, above). The technology of Si, Ge, and SiC is discussed in subvolume III/17c. The technological data of other semiconductors are covered in subvolume III/17d. In accordance with the importance of technological applications, emphasis has been placed especially on the Si-technology and that of the III-V semiconductors. Nevertheless, all technological important semiconductors, even exotic ones, are included.

The two subvolumes have been published in 1983/84.

Data presented: For each material subsections are presented which include the following information: 1. Technological data: Phase diagrams, vapour pressures, solubilities, melt diffusion coefficients, viscosity, surface tension etc.

2. Crystal growth: Synthesis, purification, zone melting, pulling techniques, directional solidification, sheet growth, vapour phase growth, gradient freeze methods, solid state recrystallization, wafer preparation etc.

3. Characterization of crystal properties: Doping profiles, impurities, defects, polypipe verification, surface properties, diagnostic techniques etc.

4. Device technology: Basic device structures, diffusion, ion implantation, nuclear transmutation doping, epitaxy, fabrication of layers, metallization, lithography, etching processes, final device preparation etc.

Arrangement of the data: The data are arranged in the following groups: Subvolume III/17c: Silicon and germanium / silicon carbide, subvolume III/17d: III-V compounds, II-VI compounds (wide-gap, narrow-gap), IV-VI compounds, HgI_2 , Se.

An subject index is contained in the comprehensive index for all subvolumes of III/17 at the end of subvolume III/17i.

shielding against high energy radiation

Topic of volume I/11.

Contents of the volume: In this volume data were compiled which are needed for the design of shielding against ionizing radiation.

Values obtained experimentally are compared with values derived from the basic physical phenomena by analytic calculations or Monte Carlo models.

The volume has been published in 1990.

Data presented: Data for hadron attenuation (physical processes, hadron - nucleus scattering, hadron cascades, shielding thicknesses, energy deposition), electron attenuation (physical processes, electromagnetic cascades, showers, photonuclear reactions), muon transport (muon slowing down and scattering), neutron attenuation, neutron skyshine, photon attenuation.

Arrangement of the data: The data are presented as formulae, graphics or concrete instructions for shielding designs.

static dielectric constants of pure liquids and binary liquid mixtures

Topic of volume IV/6.

Contents of the volume: In this volume a complete collection of data on the static dielectric constant of pure liquids and liquid binary mixtures is presented. The volume supplements and revises tables of the respective chapter in volume II/6 of the 6th Edition.

Data presented: Dielectric constants (relative permittivity) as function of temperature and - for mixtures - of concentration (mole, volume or mass fraction)

Arrangement of the data: Two chapters contain pure liquids (liquid elements, inorganic liquids, organic liquids) and binary mixtures.

The pure liquids are organized by their sum formula ordered according to Hilsenrath system. The CAS Registry Number is given. For mixtures gross formulae and composition are given.

A list of substances is given at the end of the volume containing all pure liquids and all components of binary mixtures.

structure data of diatomic and polyatomic molecules (experimental)

Topic of volumes II/7, 15, 21, 23.

Contents of the volumes: The volumes contain structural data of free polyatomic molecules in the ground state and in excited electronic states. More than 800 inorganic and 2500 organic molecules are covered. Volume II/7 contains data published up to 1974, volumes II/15, 21 and 23 supplement data up to 1994.

A short table of structure data of several alkali halogenides is given in volumes II/21 and II/23 presenting internuclear distances measured by electron diffraction.

Data presented: For each molecule the following data are given (if accurate experimental values have been reported in the literature): – Gross formula, name, symmetry, schematic structure formula.

– Experimental method used (electron diffraction, infrared spectroscopy, laser induced fluorescence, laser magnetic resonance, microwave spectroscopy, nuclear magnetic resonance, photoelectron spectroscopy, Raman spectroscopy, ultraviolet spectroscopy).

– Data on: interatomic distances, atomic coordinates, point-group symmetry, wavenumbers of vibrational modes and force constants.

– Remarks, references to the original literature.

Arrangement of the data: All volumes are arranged as follows: 1 Introduction, 2 Inorganic molecules, 3 Organic molecules. (In II/21 and II/23 a short table on diatomic molecules is also provided). No Substance index is provided since all molecules are ordered alphabetically according to their stoichiometric gross formula (organic molecules according to Hill's system). Molecules already dealt with in previous volumes are listed again at their appropriate places with references to their substance number in the respective volume. Thus, subvolume II/23 should be taken to get full information about the molecules dealt with in all four volumes.

structure data of diatomic and polyatomic molecules (theoretical)

Topic of volume II/22.

Contents of the volume: This volume supplements the volumes mentioned above by theoretical data on molecules, where no or little experimental data are available. All data have been calculated at a uniform level with an ab initio molecular orbital theory. Up to the end of 1995 two subvolumes have been published: II/22a on (372) molecules with multiple bonds, II/22b on (226) small ring molecules.

Data presented: – Gross formula, name, symmetry, schematic structure formula containing the important bond lengths.

– Cartesian coordinates, bond lengths and angles, absolute energy.

Arrangement of the data: The arrangement of the data follows that in the volumes on experimental data. An Index of Molecules is provided in each subvolume. A diskette, containing an ASCII file with the cartesian coordinates of all molecules is enclosed.

structure data of elements and intermetallic phases

Topic of volumes III/6, III/14.

Contents of the volumes: Volume III/6 and its supplement and extension III/14(a,b1,b2) presents structure data and related information for elements and for intermetallic phases measured by diffraction methods (X-ray, neutron, electron). Included are all substances *not* containing F, Cl, Br, I, O, N, At and are not "organic" (do not contain any of the following groups: C-H, C-C, C-halogen, C-NH₂ and C=NH). Volume III/6 covers data published up to 1967, the three subvolumes of III/14 supplement data up to 1985/86.

Data presented: The tables contain for each substance: chemical formula, space group, lattice constants, number of formulae in the unit cell, density, structure type and extent of structural determination. Additional informations are: range of existence of the phases, dependence on composition, preparation of the material.

Arrangement of the data: Volume III/6 is organized as follows: 1 Introduction containing crystal symmetry tables and details to the organization of the volumes. 2 Elements (and solid solutions of (Ar,N₂)). 3.1 Borides (systems containing B, B-C and B-H but not O, N, or a halogen). 3.2 Carbides (systems containing C but not B, N, O, a halogen or H, but including carbohydrides). 3.3 Hydrides (systems containing H but not B, C, N, O or a halogen). 4 Intermetallic phases (systems not containing B, C, H, N, O or a halogen, as sulfides, selenides, tellurides, phosphides, arsenides, antimonides, bismuthides, alloys).

Subvolume III/14a supplements and extends chapters 2 and 3 of III/6, subvolumes III/14b1 and b2 three groups of intermetallic phases (chapter 4 of III/6): sulfides, selenides, tellurides.

The arrangement of formulae within each table is strictly alphabetically with the following exceptions: For borides, carbides and hydrides the usual notation has been used (CuSeB, TaC, NaSH ...). In solid solutions the formula begins with the host element or compound.

Since all substances can be easily localized by the alphabetical arrangement of the gross formulae no index of substances has been provided. Only short indexes of mineral and common names have been added.

structure data of inorganic substances

Topic of volume III/7.

Contents of the volume: The volume presents in 15 subvolumes structure data and related information for inorganic compounds measured by diffraction methods (X-ray, neutron, electron) and spectroscopical methods (infrared, Raman, NMR, NQRS). Included are all substances containing at least one of the elements F, Cl, Br, I, O, N or P and are not "organic" (do not contain any of the following groups: C-H, C-C, C-halogen, C-NH₂ and C=NH). Data published up to spring 1972 have been included.

Data presented: The tables contain for each substance: chemical formula (mineral name, trivial name), space group, lattice constants, number of formula units in the unit cell, density, structure type and extent of structural determination. Related data are optionally included as: color, habit, cleavage, hardness, refractive index, electron density distribution, Debye-Waller factor, structure factors, melting point, boiling point, thermal stability, Curie and Néel temperatures, epitaxy.

Arrangement of the data: The substance groups are arranged according to "key elements". i.e. to those elements which form anions by themselves in the compound or together with other elements. This arrangement allows to take chemical and crystallographical relationships into consideration. For a detailed discussion of this concept see the Introductions to all subvolumes.

The subdivision of volume III/7 into subvolumes and chapters is shown in the following survey: III/7a:

Key elements: F, Cl, Br, I

I: Halides and complex halides

III/7b1: Key elements: O, S, Se, Te

II: Oxides and hydroxides: Simple oxides and simple hydroxides.

III/7b2: Key elements: O, S, Se, Te

II: Oxides and hydroxides: Oxide hydrides, oxide halides, hydroxide halides

III: Oxo- compounds of halogens and xenon

III/7b3: Key elements: O, S, Se, Te

IV: Sulfur compounds (sulfides, sulfites, sulfates, further oxo-compounds)

V: Compounds of selenium and tellurium

III/7c1: Key elements: N, P, As, Sb, Bi, C

Nitrogen compounds (ammonia and derivatives, azides, oxo-compounds ...)

III/7c2: Key elements: N, P, As, Sb, Bi, C

VII: Phosphorus compounds (phosphides, oxo-compounds ...)

VIII: Compounds of arsenic, antimony, and bismuth

III/7c3: Key elements: N, P, As, Sb, Bi, C

IX: Carbon compounds (graphite intercalates, carbides, carbonyls, carbonates ...)

III/7d1: Key elements: Si, Ge, Sn, Pb; B, Al, Ga, In, Tl; Be

X: Silicates (Subvolumes III/7d1 α and d1 β)

XI: Germanates (Subvolume III/7d1 γ)

XII: Stannates and plumbates (Subvolume III/7d1 γ)

III/7d2: Key elements: Si, Ge, Sn, Pb; B, Al, Ga, In, Tl; Be

XIII: Boron compounds

XIV: Oxo-compounds of aluminium, gallium, indium, thallium, beryllium)

III/7e: Key elements: d⁹-, d¹⁰-, d¹ ... d³-, f-elements

XV: Compounds of copper, silver, gold, zinc, cadmium, and mercury

XVI: Compounds of scandium, yttrium, of the lanthanoids and actinoids

XVII: Compounds of titanium, zirconium, and hafnium

XVIII: Compounds of vanadium, niobium, and tantalum

III/7f: Key elements: d⁴ ... d⁸-elements

XIX: Compounds of chromium, molybdenum, and tungsten

XX: Compound of manganese, technetium, and rhenium

XXI: Compounds of iron, cobalt, nickel, and the platinum metals

Subvolume III/7g contains the references to subvolumes III/7a ... f.

Subvolume III/7h contains a comprehensive index with alphabetical formula index and mineral name index.

structure data of organic substances

Topic of volumes III/5, III/10.

Contents of the volumes: Volume III/5 and its supplement III/10 presents structure data and related information on all organic compounds whose crystal structure was completely or only partially determined by X-ray investigation.

Additional results obtained by electron and neutron diffraction have also been included. Volume III/5 covers data published up to 1968, volume III/10 supplements data published up to 1973.

Data presented: The volumes provide data of space group, lattice constant, number of formulae in the unit cell, density, extent of the structure determination. Additional information is given on color, habit, solubility, melting temperature, boiling temperature etc. Included are organic compounds, elemento-organic compounds, salts and coordination compounds with at least one organic substituent. Exceptions are the cyanides (dealt with in volume III/7) and proteins.

Arrangement of the data: The substances are arranged according to increasing C- and H-numbers. Structural formulae are added. Both volumes are subdivided into subvolumes. Subvolume III/5a covers C ... C₁₃, subvolume III/5b C₁₄ ... C₁₂₀; subvolume III/10a covers C ... C₁₅, subvolume III/10b C₁₆ ... C₁₆₈.

The subvolumes 5b and 10b contain indexes of substances: III/5b: comprehensive index of substances, special index of coordination compounds and elemento-organic compounds.

III/10b: comprehensive index of substances, index of cyclic compounds, CAR-numbers.

superconductors

Topic of volume III/21.

Contents of the volume: The volume presents a complete compilation of the superconducting data of elements, alloys and compounds. The compilation comprises not only transition temperatures, but also

preparation technique, thermal history, crystal structure and lattice parameters. By adding further parameters it is aimed to give a complete information about the low temperature properties of a given substance. When available, low temperature data of proven non-superconductors have been included, indicating in each case the lowest temperature of investigation.

Subvolume III/21a has been published 1990, subvolumes III/21b1 and III/21b2 1993 and 1994, respectively. Further subvolumes are in preparation.

Data presented: The tables include information on experimental data on bulk materials, thin films, junctions, multilayers, superlattices, granular superconductors, mono- and multifilamentary wires. For each material the following data have been given: characterization (morphology, modification and shape of the samples, sample preparation, material history), crystal structure, superconducting transition temperatures (also lowest temperature of investigation of materials where no superconductivity was found), other properties as electronic specific heat, Debye temperature, critical fields, Curie and Néel temperatures.

Arrangement of the data: The substances are arranged alphabetically by the base element (the element with the highest concentration in an alloy or compound. Within the section on a base element the substances are listed by their modification: 1: bulk element, 2: element, under pressure, 3: thin films, deposited at $T > 77\text{K}$, 4: thin films, deposited at $T < 77\text{K}$, 5: multilayers, superlattices, 6: granular films, 7: junctions, 8: dilute alloys, 9. implantation, 10: alloys and compounds.

The subvolumes contain the following base elements (compounds, alloys): subvolume III/21a Ac ... Na, subvolume III/21b1 Nb, Nb-Ar ... Nb-Ge, subvolume III/21b2 Nb-H ... Nb-Zr, Nd ... Np. Four further subvolumes are planned for the groups: O (without cuprates), ... Sc, Se ... Ti, Tl ... Zr, high T_c superconductors.

thermal conductivity of pure metals and alloys

Topic of volume III/15c.

Contents of the volume: Subvolume III/15c of volume III/15 covers data on thermal conduction of pure metals, dilute and non-dilute alloys, pure and alloyed semimetals, as well as the effect of pressure on the thermal transport of pure metals and alloys. The subvolume has been published in 1991.

Data presented: Thermal conductivity at room temperature (value, resistance ratio (273K/4K), electrical resistivity, Lorenz ratio), temperature dependence above 50K, thermal conductivity at low temperatures (residual resistivity, Lorenz ratios at intermediate and high temperatures ($> 100\text{K}$) (temperature dependence of Lorenz ratio), pressure coefficients.

Arrangement of the data: Pure metals: For each element the data have been given in tables and figures, with information about structure, melting point, sometimes also Curie and Néel temperatures. For low temperature data remarks on sample preparation has been added.

Alloys: The data have been splitted into values below and above 90K on account of the different measuring methods in both temperature ranges. All data are accompanied by information about material composition and impurity content and about the measuring technique.

The data on semimetals and the (few) data on pressure effects have been added in separate sections.

thermodynamic equilibria of boiling mixtures

Topic of volume IV/3.

Contents of the volumes: The volume supplements earlier tables on thermodynamic equilibria

of boiling mixtures in volumes II/2a and IV/4b of the 6th Edition. It contains data from the literature published since 1954 up to the beginning of 1974.

Data presented: Data on temperature, pressure and composition of liquid and vapour of boiling mixtures in thermodynamic equilibrium: vapour pressure, fugacity, ratios of mole fractions in vapour and liquid as function of temperature, activity coefficient (relative volatility), etc.

Arrangement of the data: The data are arranged in chapters on binary mixtures and on ternary and quaternary mixtures. Indexes (gross formulae, names of substances) are provided.

thermodynamic properties of organic compounds and their mixtures

Topic of volume IV/8.

Contents of the volume: Data on thermodynamic properties of organic compounds and their mixtures will be presented in six chapters. The first chapter on enthalpies of fusion and transition has been published in

subvolume a (1995). Two further subvolumes have been published till summer 1997: subvolume b: densities and vapor pressure of aliphatic hydrocarbons, subvolume c: densities of cyclic, aliphatic and aromatic hydrocarbons.

Data presented: Experimental data on the temperatures and enthalpies of solid-solid and solid-liquid transitions.

Arrangement of data: After an introduction on basic concepts and methods of determination the data are presented in increasing numbers of carbon atoms. A chemical name index and an index giving the chemical abstract service registry numbers is provided.

thermoelectric power of pure metals and dilute alloys

Chapter in volumes III/15a,b.

Contents of the chapter: Data on the thermopower of pure metals and dilute alloys are given. The literature is covered up to 1980.

Data presented: Pure metals: thermopower near room temperature, temperature dependence of thermopower, low temperature data, size and pressure dependence.

Dilute alloys: figures on the temperature dependence of the thermopower for a large number of alloys.

Arrangement of the data: Chapter 3 of volume III/15b (except the section on size effect, which is printed in subvolume III/15a).

total cross sections for reactions of high energy particles

Topic of volume I/12.

Contents of the volume: This volume supplements volumes I/6 ... I/9 concerning cross-sections of elementary particles at high energies. While the data in the volumes published describe special reactions in the most complete way (including angular distributions), this volume contains the total cross-sections of all reactions observed so far, with neutrinos, gamma rays, charged pions and kaons, nucleons and antinucleons and hyperons as incident particles.

The two subvolumes of I/12 have been published in 1987.

Data presented: For each reaction (laboratory) momenta and total cross-sections are given with total and systematic errors in tables and in plots.

Arrangement of the data: The chapters (each containing a list of reactions, cross section data and plots) are:

Subvolume a: p^- induced reactions, p^+ induced reactions, K^- induced reactions.

Subvolume b: K^+ induced reactions, proton/ neutron induced reactions, antiproton/antineutron induced reactions, hyperon induced reactions, K_L^0 induced reactions, photon induced reactions, neutrino induced reactions.

The data is grouped on the one hand into elastic and inelastic reactions and on the other hand into exclusive (all particles in the final state are observed) and inclusive (only one or few particles are measured in the final state) reactions.

Tables and figures are reproduced directly from computer outputs.

units

Topic of subvolume a of the volume "Units and fundamental constants in physics and chemistry".

Contents of the volume: This volume contains information that is related to precision experimental techniques in metrology and most extensively the description of the system of units and their realization. The contributions consist mostly of text and description of apparatus, and less of tables and figures as would be suitable for a common Landolt-Börnstein volume. In metrological experiments there is often only one number, very precise though, as a result. However, in order to understand the result, the precise description of the experiment, the sources of uncertainties, and their magnitude are of outstanding importance.

The volume has been published in 1991.

Data presented: SI units: second (units of time and frequency, time scales, standard frequency generators and clocks, transfer of time and frequency), metre, kilogram, ampere, kelvin (thermodynamic temperature, International Temperature Scale, thermometry below 1K, thermometer), mole, candela.

Derived SI units: areas, volumes, angles, density, force, pressure (vacuum, medium pressure, high pressure), mass flow, heat, internal energy, enthalpy, heat capacity, thermal transport, viscosity, electric field (energy, power, power flux density, voltage, capacitance, resistance, conductance), magnetic field

(field strength, flux density, polarization, inductance), ionizing radiation (radioactivity, absorbed dose, kerma, dose equivalent), sound (sound fields, speed of sound, sound pressure, particle velocity, sound intensity, sound power, noise measurement), optical radiation, radiometry, photometry (lux, lumen), colorimetry.

Arrangement of the data: The volume begins with a metrological introduction including the mathematical treatment of uncertainties and a description of the nomenclature in the system of physical and chemical units. The sections for the various SI and derived SI units are mostly subdivided into subsections on definition, of realization and on dissemination and maintenance.

A subject index (to subvolumes a and b) is given at the end of subvolume b.

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