

III/41: Semiconductors

General Introduction **Substance Index alphabetically ordered by element-systems:** [pdf-version](#) [html-version](#)

Subvolume III/41B: II-VI and I-VII compounds; semimagnetic compounds

[List of frequently used symbols, abbreviations, conversion factors](#)

Subvolume III/41C: Non-tetrahedrally bonded elements and binary compounds I

[List of frequently used symbols and abbreviations, conversion factors](#)

Subvolume III/41D Non-tetrahedrally binary compounds II

[List of frequently used symbols and abbreviations, conversion factors](#)

[Fast preview of substances for III/41D](#)

Subvolume III/41E Ternary compounds, organic semiconductors

[List of frequently used symbols and abbreviations, conversion factors](#)

Alphabetical List of Substances of subvolume III/41D

This list contains all substances (compounds) for which data are provided in this subvolume.

Chemical formulae of the compounds are generally given as listed in the respective document.

The compounds are arranged according to main groups (see below). These main groups are characterized by the group numbers of the Periodic System the elements of a class of compounds are belonging to. Due to the great amount of data, boron compounds are listed separately:

boron – group I compounds

boron – group II compounds

boron – group III compounds

boron – lanthanide compounds

boron – actinide compounds

boron – group IV compounds

boron – group V compounds

boron – group VI compounds

boron – group VII compounds

boron – group VIII compounds

IV – V – VIII compounds

IV – VI compounds

IV – VI – VIII compounds

IV – VII compounds

IV – VIII compounds

V – VI compounds

V – VI – VIII compounds

V – VII compounds

V – VIII compounds

VI – VI compounds

VI – VII compounds

VI – VIII compounds

binary rare-earth compounds

Each main group is divided into subgroups in which special compounds are summarized. The subgroup titles are generally listed in alphabetical order. Within each subgroup the compounds are arranged

1. alphabetically according to the first element of the compound,
2. according to the (growing) number of the first element,
3. alphabetically according to the second element of the compound,
4. according to the (growing) number of the second element, etc.

An exception are the lanthanide and actinide compounds. For these substances the order is given by their appearance in the Periodic System of the first element (i.e. by the atomic number of this element).

Examples:

NaB₆ is listed under "boron – group I compounds", subgroup "boron – sodium compounds", after NaB₅C

TiS₂ is listed under main group "IV – VI compounds", subgroup "chalcogenides of Ti, Zr, Hf", after Hf₂Se₃

ErH₃ is listed under main group "binary rare-earth compounds", subgroup "rare-earth hydrides", after HoH₃.

Please choose your substance of interest.

A click on the blue rectangle leads you to a list of substance/property combinations of this substance (or subgroup). From this list you directly proceed to the selected pdf-file.

boron compounds

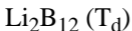
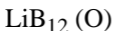
boron compounds (general data)

boron – group I compounds

boron-hydrogen alloys



binary boron-lithium compounds



LiB alloys

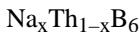
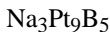
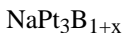
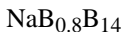
ternary boron-lithium compounds



boron-potassium compounds



boron-sodium compounds



compounds with Ib elements



boron – group II compounds

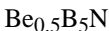
beryllium-aluminum-boron compounds



boron-alkaline earth compounds



boron-beryllium compounds



boron-cadmium compounds



boron-magnesium compounds



boron-zinc compounds



boron – group III compounds

Al-B compounds: AlB_2 , AlB_4 , AlB_{10}



α - AlB_{12}



α - AlB_{12} type compounds



β - AlB_{12}



γ - AlB_{12}



AlB_{31} , AlBeB_{22}



Al_3B_{32} and $\text{Al}_x\text{B}_{105}$

Al_3B_{32}

$\text{Al}_x\text{B}_{105}$

Al-B-C compounds

Al_3BC

Al_3BC_3

$\text{Al}_4\text{B}_x\text{C}_{3-x}$

Al-C-B compounds

$\text{AlC}_2\text{B}_{12}$

$\text{AlC}_4\text{B}_{24}$

$\text{AlC}_4\text{B}_{24\dots26}$

$\text{AlC}_4\text{B}_{40}$

$\text{Al}_3\text{C}_2\text{B}_{48}$, $\text{Al}_3\text{B}_{48}\text{C}_2$, $\text{C}_2\text{Al}_3\text{B}_{48}$, $\text{B}_{48}\text{Al}_3\text{C}_2$

$\text{Al}_3\text{C}_2\text{B}_{48}$

$\text{Al}_3\text{B}_{48}\text{C}_2$

$\text{C}_2\text{Al}_3\text{B}_{48}$

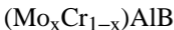
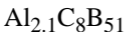
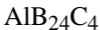
$\text{B}_{48}\text{Al}_3\text{C}_2$

Al-Mg-B and Al-Cu-B compounds

$\text{Al}_{1.44}\text{Mg}_{0.65}\text{B}_{22}$

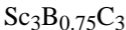
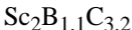
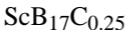
$\text{Al}_x\text{Cu}_y\text{B}_{25}$

further ternary Al-B compounds



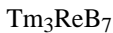
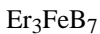
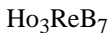
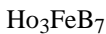
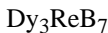
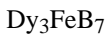
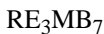
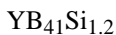
boron-scandium compounds

Sc-Al-B



LaB_6 – "ScB₆"-system

boron-yttrium and Ln_3MB_7
compounds (except YB_{66})



boron-lanthanide compounds

boron-lanthanide compounds, general data

see also boron-yttrium and Ln_3MB_7
compounds (except YB_{66})

La-B₄ type compounds



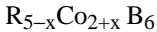
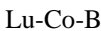
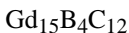
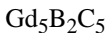
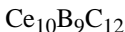
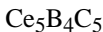
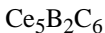
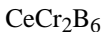
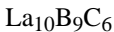
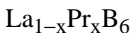
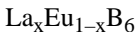
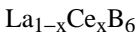
ternary LnAlB₄ tetraborides



lanthanide hexaborides



lanthanide ternary hexaborides



lanthanide dodecaborides



lanthanide borides of the type MB_{25}



lanthanide borides of the type MB_{50}



lanthanide borides of the type MB_{66}



MgAlB_{14} type borides with lanthanides

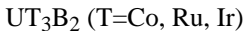


boron-actinide compounds

boron-thorium compounds



boron-uranium compounds



boron-plutonium compounds

PuB

PuB_2

PuB_4

PuB_6

PuB_{12}

PuB_{66}

boron-americium compounds

AmB_4

AmB_6

ternary actinide compounds

AT_3B_2

AT_2B_2

AT_4B_4

ATB_2

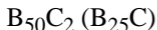
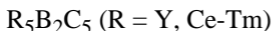
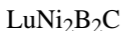
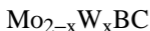
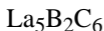
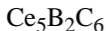
ATB_4

A_2TB_6

A = Actinoid element, T = one of the 3d, 4d
or 5d transition elements

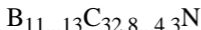
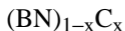
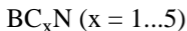
boron – group IV compounds

boron-carbon compounds (general remarks
and special compounds)



boron carbide ($\text{B}_{4.3}\text{C}$ to $\text{B}_{\sim 11}\text{C}$)

boron carbonitrides



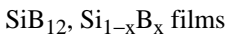
boron-germanium compounds



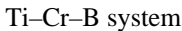
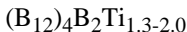
boron-hafnium compounds



boron-silicon compounds



boron-titanium compounds

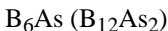


boron-zirconium compounds

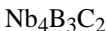


boron – group V compounds

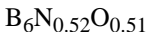
boron-arsenic compounds



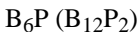
boron-niobium compounds



boron-nitrogen compounds



boron-phosphorus compounds



boron-tantalum compounds

(see also "compounds with Vb elements")



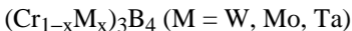
boron-vanadium compounds

(see also "compounds with Vb elements")



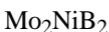
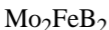
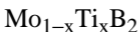
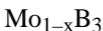
boron – group VI compounds

boron-chromium compounds



boron-molybdenum compounds

(see also "compounds with Vb elements")



boron-oxygen compounds



boron-selenium compounds



boron-sulfur compounds



boron-tungsten compounds

α -WB

β -WB

δ -WB

WB₂

WB₄

WB₁₂

W₂B

α -W₂B₅

β -W₂B₅

boron uranium carbon compounds

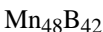
UB_{1-x}C_{1+x}

boron – group VII compounds

boron-halogen compounds



boron-manganese compounds



boron-rhenium compounds

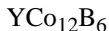
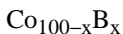
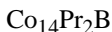
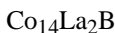
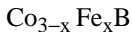
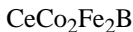


boron-technetium compounds



boron – group VIII compounds

boron-cobalt compounds



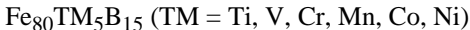
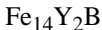
Co-Ni-Si-B alloys

RCo_4B compounds (R = Y, Pr, Nd, Sm, Gd, Tb)

boron-iridium compounds



boron-iron compounds



amorphous (glassy) Fe – B alloys

boron-nickel compounds

NiB

NiB₂₅

Ni₂B

Ni₃B

Ni₄B₃ (o)

Ni₄B₃ (m)

Ni₄CeB

Ni₄LaB

Ni₄PrB

Ni₄YB

amorphous (glassy) Ni – B alloys

boron-palladium compounds

Pd₃B

Pd₅B₂

boron-platinum compounds

PtB

Pt₂B

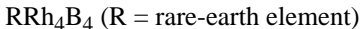
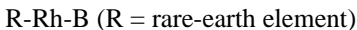
Pt₃B

Pt₄B

boron-osmium compounds



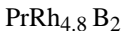
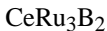
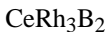
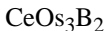
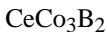
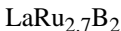
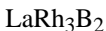
boron-rhodium compounds



boron-ruthenium compounds



ternary borides with group VIII elements



ErIr_4B_4

ErRh_4B_4

TmIr_4B_4

TmRh_4B_4

LuB_2

LuOs_3B_2

LuRh_4B_4

LuRuB_2

ThIr_3B_2

ThOs_3B_2

ThRh_4B_4

RM_4B_4 (R = rare-earth element; M = Ru, Rh, Os, Ir)

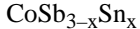
$\text{R}(\text{Os, Ir})_4\text{B}_4$ (R = rare-earth element)

$\text{R}(\text{Rh}_{1-x}\text{Ir}_x)_4\text{B}_4$ (R = Gd, Tb, Dy, Ho, Er, Tm, Lu)

RRh_3B_2 (R = La to Gd)

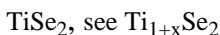
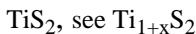
RRuB_4 (R = Gd, Tb, Dy, Ho, Er, Tm, Lu, Y)

IV–V–VIII compounds

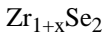
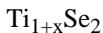


IV–VI compounds

chalcogenides of Ti, Zr, Hf, general



TiTe_2 , see chalcogenides of Ti, Zr, Hf, general



binary transition metal oxides, general

titanium oxides, general

TiO, see titanium oxides, general

TiO_{2-x}

TiO_2

Ti_2O_3

Ti_3O_5

Ti_4O_7

Ti_5O_9

Ti_6O_{11}

Ti_7O_{13}

Ti_8O_{15}

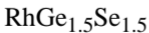
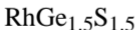
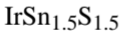
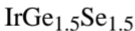
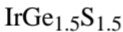
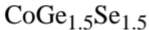
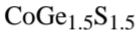
Ti_9O_{17}

$\text{Ti}_n\text{O}_{2n-1}$

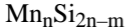
CrSi_2

IV–VI–VIII compounds

(transition metal)-IV_{1.5}VI_{1.5} compounds



IV–VII compounds



IV–VIII compounds



V–VI compounds

CrP_4 , see V–VII compounds,
group VII–tetraphosphides, general

CrSb_2

MoP_4 , see V–VII compounds,
group VII–tetraphosphides, general

chalcogenides of V, Nb, Ta, general

NbO_x , see Nb_2O_5

NbO_2

NbS_3

$\text{Nb}_2\text{O}_{5-x}$, see Nb_2O_5

Nb_2O_5

$\text{Nb}_{12}\text{O}_{29}$, see Nb_2O_5

$\text{Nb}_{22}\text{O}_{54}$, see Nb_2O_5

$\text{Nb}_{25}\text{O}_{62}$, see Nb_2O_5

$\text{Nb}_{32}\text{O}_{79}$, see Nb_2O_5

TaS₂

TaS₃

TaSe₂, see chalcogenides of V, Nb, Ta, general

Ta₂O₅

VO₂

VO_{2+x}, see VO₂

V₂O₃

V₂O_{3+x}, see V₂O₃

V₂O_{5-x}, see V₂O₅

V₂O₅

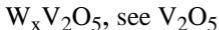
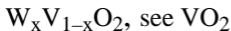
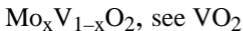
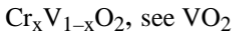
V₃O₅

V₃O₇

V₄O₇

V₄O₉

V₅O₉



V-VI-VIII compounds

transition metal-V-VI compounds, general

CoAsS

CoAsSe

CoPS

CoPSe

CoSbS

CoSbSe

CoSbTe

$\text{CoSb}_{2-x}\text{Te}_x$

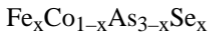
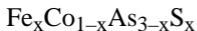
$\text{CoSb}_{3-x}\text{Te}_x$

$\text{Cr}_{1-x}\text{Fe}_x\text{Sb}_2$

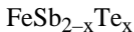
FeAsS

FeAsSe

FeAsTe, see transition metal-V-VI
compounds, general



FeSbSe, see transition metal-V-VI
compounds, general



IrAsS, see transition metal-V-VI
compounds, general

IrAsSe, see transition metal-V-VI
compounds, general

IrAsTe, see transition metal-V-VI
compounds, general

IrBiS, see transition metal-V-VI
compounds, general

IrBiSe, see transition metal-V-VI
compounds, general

IrBiTe, see transition metal-V-VI
compounds, general

IrPS, see transition metal-V-VI
compounds, general

IrPSe, see transition metal-V-VI
compounds, general

IrSbS, see transition metal-V-VI
compounds, general

IrSbSe, see transition metal-V-VI
compounds, general

IrSbTe, see transition metal-V-VI
compounds, general

$\text{NiAs}_{2-x}\text{S}_x$

$\text{NiAs}_{2-x}\text{Se}_x$

OsAsS

OsAsSe

OsAsTe

OsBiSe

OsPS

OsPSe

OsSbS

OsSbSe

OsSbTe

OsSb_{2-x}Te_x

PdPS

PdPSe

PdPS_{1-x}Se_x

RhAsS, see transition metal-V-VI
compounds, general

RhAsSe, see transition metal-V-VI
compounds, general

RhAsTe, see transition metal-V-VI
compounds, general

RhBiS, see transition metal-V-VI
compounds, general

RhBiSe, see transition metal-V-VI
compounds, general

RhBiTe, see transition metal-V-VI
compounds, general

RuAsS

RuAsSe

RuAsTe

RuPS

RuPSe

RuSbS

RuSbSe

RuSbTe

V–VII compounds

group VII–tetraphosphides, general



TcP_4 , see group VII–tetraphosphides, general

V–VIII compounds

transition metal–V₂ compounds, general

T_{1-x}T'_xV₃ compounds, general

transition metal–V₃ compounds, general

CoAs₂

CoAs_{3-x}Sb_x, see T_{1-x}T'_xV₃ compounds,
general

CoAs₃, see transition metal–V₃
compounds, general

Co_{1-x}Fe_xAs₃, see T_{1-x}T'_xV₃ compounds,
general

Co_{1-x-y}Fe_xNi_yAs₃, see transition metal–V₃
compounds, general

Co_{1-x}Fe_xSb₃, see T_{1-x}T'_xV₃ compounds,
general

Co_{1-x}Ni_xAs₂

Co_{1-x}Ni_xAs₃, see T_{1-x}T'_xV₃ compounds,
general



$\text{Co}_{1-x}\text{Ni}_x\text{Sb}_3$, see $\text{T}_{1-x}\text{T}'_x\text{V}_3$ compounds,
general



$\text{CoP}_{3-x}\text{As}_x$, see $\text{T}_{1-x}\text{T}'_x\text{V}_3$ compounds,
general

CoP_3 see transition metal- V_3
compounds, general



$\text{CoSb}_{3-x}\text{Bi}_x$, see $\text{T}_{1-x}\text{T}'_x\text{V}_3$ compounds,
general

CoSb_3 , see transition metal- V_3
compounds, general



FeAs₂

FeP₂

FeP₄

FeSb₂

Ir_{1-x}Pt_xAs₃, see T_{1-x}T'_xV₃ compounds,
general

IrAsSb

IrAs₂

IrAs₃, see transition metal-V₃
compounds, general

IrBi₂, see transition metal-V₂
compounds, general

IrP₂

IrP₃, see transition metal-V₃
compounds, general

IrSb₂

IrSb₃, see transition metal-V₃
compounds, general

$\text{Ni}_{1-x}\text{Pd}_x\text{As}_2$

$\text{Ni}_x\text{Pt}_{1-x}\text{As}_2$, see NiSb_2

NiAs_2

NiP_2

NiSb_2

OsAs_2

OsP_2

OsP_4

OsSb_2

PdAs_2 , see transition metal- V_2
compounds, general

PdPAs

PdP_2

PdSb_2 , see transition metal- V_2
compounds, general

PtAs_2

PtBi_2 , see transition metal- V_2
compounds, general

PtPAs

PtP₂

PtSbBi, see transition metal-V₂
compounds, general

PtSb₂

Rh_{1-x}Pd_xAs₃, see T_{1-x}T'_xV₃ compounds,
general

RhAsSb

RhAs₂

RhAs₃, see transition metal-V₃
compounds, general

RhBi₂

RhP₂

RhP₃, see transition metal-V₃
compounds, general

RhSb₂

RhSb₃, see transition metal-V₃
compounds, general

RuAs₂

RuPAs

RuP₂

RuP₄

RuSb₂

VI-VI compounds

chalcogenides of Cr, Mo, W, general

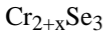
higher oxides of chromium, general

tungsten oxides, general



CrO_2 , see higher oxides of chromium, general

CrO_3 , see higher oxides of chromium, general



Cr_5O_{12} , see higher oxides of chromium, general

Cr_6O_{15} , see higher oxides of chromium, general

MoO_3

MoS_2

MoSe_2

MoTe_{2-x}

WO_2 , see tungsten oxides, general

WO_3

WS_2

WSe_2

WTe_2

$\text{W}_{18}\text{O}_{49}$, see tungsten oxides, general

$\text{W}_n\text{O}_{3n-(m-1)}$, see tungsten oxides, general

VI–VII compounds

chalcogenides of Mn, Tc, Re, general



VI–VIII compounds

chalcogenides of Fe, Ru, Os, general



$\text{FeS}_{1-x}\text{Te}_x$, see chalcogenides of Fe, Ru, Os,
general

FeS , see chalcogenides of Fe, Ru, Os,
general



FeSe , see chalcogenides of Fe, Ru, Os,
general



Fe_2O_3

Fe_2Se_3 , see chalcogenides of Fe, Ru, Os,
general

Fe_2Te_3 , see chalcogenides of Fe, Ru, Os,
general

Fe_3O_4

Fe_3S_4 , see chalcogenides of Fe, Ru, Os,
general

Fe_7S_8 , see chalcogenides of Fe, Ru, Os,
general

Fe_7Se_8 , see chalcogenides of Fe, Ru, Os,
general

OsS_2

OsSe_2

OsTe_2

RuS_2

RuSe_2

RuTe_2

chalcogenides of Co, Rh, Ir, general

CoO

Co₃O₄

IrS₂

IrS₃

IrSe₂

IrSe₃, Ir_{2/3}Se₂

RhS₃, see also Rh_{2/3}S₂

RhSe₂

RhSe₃, Rh_{2/3}Se₂

Rh₂S₃

Rh_{2/3}S₂

chalcogenides of Ni, Pd, Pt, general

Ni_{1-x}O, see NiO

Ni_{1-x}S

NiO

NiO₂, see NiO

NiS₂

Ni₂O₃, see NiO

Ni₃O₄, see NiO

PdO

PdS

PdS₂

PdSe

PdSe₂

Pt_{1-x}S₂

PtS

PtSe₂

binary rare-earth compounds

rare-earth hydrides



rare-earth monopnictides and monochalcogenides

YP

LaP

SmP

ErP

LuP

SmS

SmSe

$\text{SmS}_{1-x}\text{Se}_x$

SmTe

EuO

EuS

EuSe

EuTe

TmTe

$\text{TmSe}_{1-x}\text{Te}_x$

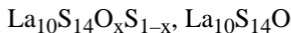
$\text{Tm}_{1-x}\text{Eu}_x\text{Se}$

YbS

YbSe

YbTe

rare-earth polychalcogenides



Sm_2O_3

Sm_2S_3

Sm_2Se_3

Eu_2O_3

Eu_2Se_3

Gd_2O_3

Gd_2S_3

Gd_2Se_3

Tb_2O_3

Tb_2S_3

Dy_2O_3

Dy_2S_3

Dy_2Se_3

Ho_2O_3

Ho_2S_3

Er_2O_3

Er_2S_3



rare-earth chlorides

