



Database name:	TCS Ionic Solutions Database	Database version:	3.0
Database acronym:	ION3		
Database owner:	Thermo-Calc Software AB		
Database segment:	Ionic Solutions		

Brief description

ION3 database is suitable for oxides, silicates, carbides, nitrides, sulfides and arsenides.

Applications

Ceramics, superconductors, metal/alloy processing, solid oxide fuel cells, hard materials, materials corrosion and fusion processes.

Included Elements

Ag Al As Bi C Ca Cr Cu Fe La Mg Mn N Ni O S Si
Sr Y Zr

Included Phases

ION3 database contains both an ionic liquid and a metallic liquid solution phase, a large gaseous mixture phase, and many stoichiometric solids and solid solution phases (e.g., oxides, silicates, carbides, nitrides, sulfides, arsenides, etc.). Total amount of different phases is 282.

In the ionic liquid phase (IONIC-LIQ), the edge metal systems have been included. For this reason, the metallic liquid solution phase (LIQUID) should not be considered simultaneously. For solid phases (and the metallic liquid mixture), the ION3 database is compatible with the SSOL Solutions Database, SSUB Substances Database, TCFE Steels/Fe-Alloys Database and TCNI Ni-based Superalloys Database and/or other appropriate databases.

Assessed Systems

The data for specific subsystems are critically assessed to include the stable elements (in their metallic forms), and various ionic and neutral forms in their respective ionic liquid, or solid phases (metallic alloying compounds, oxides/silicates/carbides/nitrides/sulfides/arsenides/...). Data for solubility in various solid solution phases have also been taken into account. For systems without oxygen and with low contents of C/N/S/As components, the metallic liquid solution phase (LIQUID) is also considered.

Pure metallic systems:

All binary, ternary and higher-order subsystems for which we have assessed data in the Al-Ag-Bi-Ca-Cr-Cu-Fe-La-Mg-Ni-Si-Sr system are included in the metallic liquid and alloy solution phases.

Binary Me-O/C/N systems:

Al-O, Bi-O, Ca-O, Cr-O, Cu-O, Fe-O, La-O, Mg-O, Mn-O, Ni-O, Si-O, Sr-O, Y-O, Zr-O, Fe-C, Si-C, Al-N, Fe-N, Si-N.

Higher-order O/C/N-bearing systems (where all lower-order subsystems have been evaluated): Al₂O₃-CaO-MgO, Al₂O₃-CaO-SiO₂, CaO-MgO-SiO₂, Al-Ca-Mg-Si-O, CaO-Fe-O-SiO₂, Al₂O₃-SiO₂-Y₂O₃, Si-Al-O-N, Al-Fe-N, Fe-Cr-Ni-C-O, Fe-Si-C-N (provisional), Ag-Bi-O, Ag-Cu-O, Bi-Ca-O, Bi-Cu-O, Bi-Sr-O, Ca-Cu-O, Ca-Sr-O, Cu-Sr-O, La-Mn-O, La-Ni-O, La-Sr-O, La-Y-O, La-Zr-O, Fe-Mn-O, Mn-Sr-O, Mn-Y-O, Mn-Zr-O, Y-Zr-O, Ag-Ca-Cu-O, Ag-Cu-Sr-O, Bi-Ca-Sr-O, Bi-Cu-Sr-O, Bi-Ca-Cu-O, Ca-Cu-Sr-O, Bi-Ca-Cu-Sr-O.

Binary Me-S systems:
Fe-S, Cu-S and Mn-S.

Binary Me-As systems:
Cu-As and Fe-As.

Ternary Me-Me-S systems:
Fe-Cu-S

Limits

Critical calculations must always be verified by equilibrium experimental data; it is the user's responsibility to verify the calculations but Thermo-Calc Software is interested to know about any significant deviations in order to improve any future release.

Scientific Models & References

See the Thermo-Calc Software reference list available at:

http://www.thermocalc.com/DOWNLOAD_AREA/References.html