



Database name: SGTE Nobel Metal Alloys Database
Database acronym: SNOB1 **Database version:** 1.1
Database owner: Scientific Group Thermodata Europe
Database segment: Noble Metals

Brief description

SNOB1 is suitable for thermodynamic calculations of noble metal alloys.

Applications

Nobel metals research and development.

Included Elements

Ag Al As Au Bi C Co Cr Cu Fe Ge In Ir Mg Ni Os Pb
Pd Pt Rh Ru Sb Si Sn Ta Te Ti Tl Zn Zr

Included Phases

Total amount of different phases is 159 but it includes not a gas mixture phase. The gaseous mixture phase should be appended from other databases (e.g. SSUB). It is important to include the gas phase in calculations involving the Au-Te system, otherwise an inverted miscibility gap is predicted in the liquid phase for Te-rich alloys.

Two descriptions of the Pd-Sn binary system are provided. The first description uses a simplified, stoichiometric modelling of the compound phases, which is compatible with the assessed compound parameters for the Pd-Pt-Sn and Au-Pd-Pt-Sn systems. The second description provides a more rigorous modeling for the Pd-Sn binary join.

Assessed Systems

It contains evaluated thermodynamic data for noble metal alloys of:

Ag, Au, Ir, Os, Pd, Pt, Rh and Ru.

alloyed amongst themselves, and also in alloys with other elements:

Al, As, Bi, C, Co, Cr, Cu, Fe, Ge, In, Mg, Ni, Pb, Sb, Si, Sn, Ta, Te, Ti, Tl, Zn and Zr.

Systems assessed over complete range of composition:

Ag-Al, Ag-Au, Ag-Bi, Ag-Cu, Ag-Ge, Ag-In, Ag-Ir, Ag-Mg, Ag-Os, Ag-Pb, Ag-Pd, Ag-Pt, Ag-Rh, Ag-Ru, Ag-Sb, Ag-Si, Ag-Sn, Ag-Ti, Ag-Tl, Ag-Zn, Ag-Zr, Au-Al, Au-As, Au-Bi, Au-C, Au-Cr, Au-Cu, Au-Ge, Au-In, Au-Pb, Au-Pd, Au-Pt, Au-Rh, Au-Ru, Au-Sb, Au-Si, Au-Sn, Au-Te, Au-Ti, Au-Tl, Pd-Co, Pd-Fe, Pd-Ir, Pd-Ni, Pd-Pb, Pd-Pt, Pd-Ru, Pd-Sn, Pd-Ti, Pt-Co, Pt-Cr, Pt-Rh, Pt-Ru, Pt-Sn, Pt-Ta, Pt-Ti, Rh-Ru, Sn-Zn, In-Zn and Sn-In.

Systems assessed over a partial range of composition:

Au-Zn: to 50 at% Zn (crude description)

Pd-In: to 35 at% In

Pd-Zn: to 50 at% Zn (no reliable phase diagram information available)

Pt-In: to 30 at% In

Pt-Zn: only estimated data for the compounds Pt₃Zn and PtZn

Ag-Cu-Pb: liquid

Au-In-Pb: liquid

Au-Pd-Pt: fcc

Pd-Pt-Sn: liquid, (Pd,Pt)₂Sn, (Pd,Pt)₃Sn₂, (PdPt)₅Sn₃

Pd-Pt-Ti: (Pd,Pt)Ti, (Pd,Pt)₃Ti

Au-Pd-Pt-Sn: (Au,Pd,Pt)Sn, (Au,Pd,Pt)₃Sn, (Au,Pd,Pt)Sn₄

Limits

Combinations of several critically-assessed systems can calculate and extrapolate higher-order multicomponent systems. Such extrapolations require experience and understanding and the producer or vendor should be contacted if problems occur. 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