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<b>Database name:</b>	TCS Fe-containing Slag Database	<b>Database version:</b>	2.2
<b>Database acronym:</b>	SLAG2		
<b>Database owner:</b>	Thermo-Calc Software AB		
<b>Database segment:</b>	Fe-containing slag		

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### Brief description

SLAG2 is suitable for activity and phase equilibrium calculations in metallurgical slag systems containing iron.

### Applications

Alloy design and engineering; Metallurgy.

### Included Elements

Ag	Al	Ar	B	C	Ca	Co	Cr	Cu	F	Fe	H	Mg	Mn	Mo	N	Na
Nb	Ni	O	P	Pb	S	Si	Sn	Ti	U	V	W	Zr				

### Included Phases

SLAG2 database contains a liquid slag phase, as well as an Fe-rich liquid phase (dilute solution), a pure FeO liquid phase, a large gaseous mixture phase, and many stoichiometric solids and solid solution phases (e.g., oxides, silicates, sulfides, phosphates, halites, etc.). Total amount of different phases is 65.

The slag phase (containing oxide/silicate/sulfide/phosphate/fluoride species), as well as various oxide, silicate, sulfide, phosphate and fluoride solids phases, cover 12 elements (Al-Ca-Cr-Fe-Mg-Mn-Na-Si-O-S-P-F).

The Fe-Liquid solution phase includes 26 dilute components (Ag-Al-B-C-Ca-Co-Cr-Cu-H-Mg-Mn-Mo-N-Nb-Ni-O-P-Pb-S-Si-Sn-Ti-U-V-W-Zr). The recommended composition limit of any minority component, in the 27-component diluted Fe-rich liquid, is only 0.1 wt%. In some cases, data could be used at much higher concentrations in the Fe-rich liquid phase, but the user must carefully check each of such cases.

The gaseous mixture phase and many solid phases (stoichiometric or solution), as in the entire 30-element framework, are included.

For steels and various alloys, as well as other substance or solution phases, which are in interactions with the Fe-rich liquid phase or the liquid slag phase, thermodynamic data can be appended from other available databases, such as TCFE, TCNI, SSUB, SSOL, TCMP, TCES, TTAI/Mg/Ni/Ti, SALT, TCAQ, AQS, GCE, NUMT, NUOX, etc.

### Assessed Systems

Thermodynamic data for the liquid slag phase and oxide/silicate solid phases within the Al<sub>2</sub>O<sub>3</sub>-CaO-CrO-Cr<sub>2</sub>O<sub>3</sub>-FeO-Fe<sub>2</sub>O<sub>3</sub>-MgO-MnO-Na<sub>2</sub>O-SiO<sub>2</sub> system were critically assessed by IRSID (1984), using the Kapoor-Frohberg-Gaye Quasichemical Cell Model, i.e., the Kapoor-Frohberg Slag Model with the extensions introduced by Gaye and Welfringer (1984) for complex multicomponent slag solution systems.

Data for the additional components S, P and F (as sulphide, phosphate and fluoride species in the Al-Ca-Cr-Fe-Mg-Mn-Na-Si-O-S-P-F system) in the slag phase and solid phases, which were critically assessed by IRSID (1997), have been added to the database, and it thus allows calculations of sulphide capacities of slag. Composition-dependent parameters in the solid solution phases have not been considered in this particular database.

Data for a dilute solution of many elements in the Fe-rich liquid phase are critically assessed and converted to regular solution parameters according to Hillert (1986), with modified dilute solution parameters (plus a quadratic term) in liquid iron from Sigworth and Elliot (1974), so that it becomes a consistent thermodynamic model and also generally improves the agreements of calculated results with available experimental data.

### 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](http://www.thermocalc.com/DOWNLOAD_AREA/References.html)