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# FactSage Browser

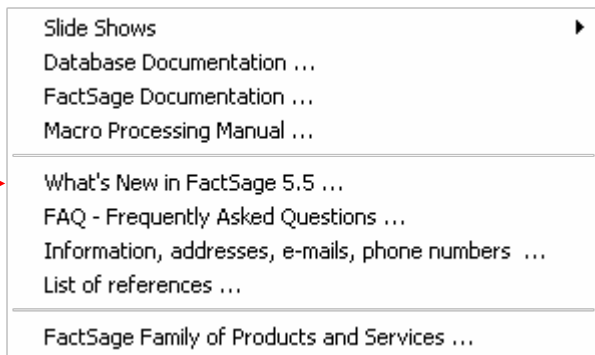
the navigation tool for

*Database*

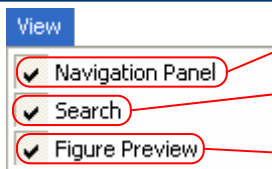
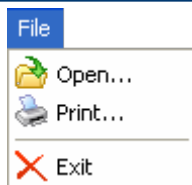
*Documentation*

# Accessing Database Documentation

Click on **Info, General > Database Documentation ...** or on **Databases, Documentation** or select **Programs > Documentation** from the Menu bar to access the database documentation via the *FactSage Browser* navigation tool.



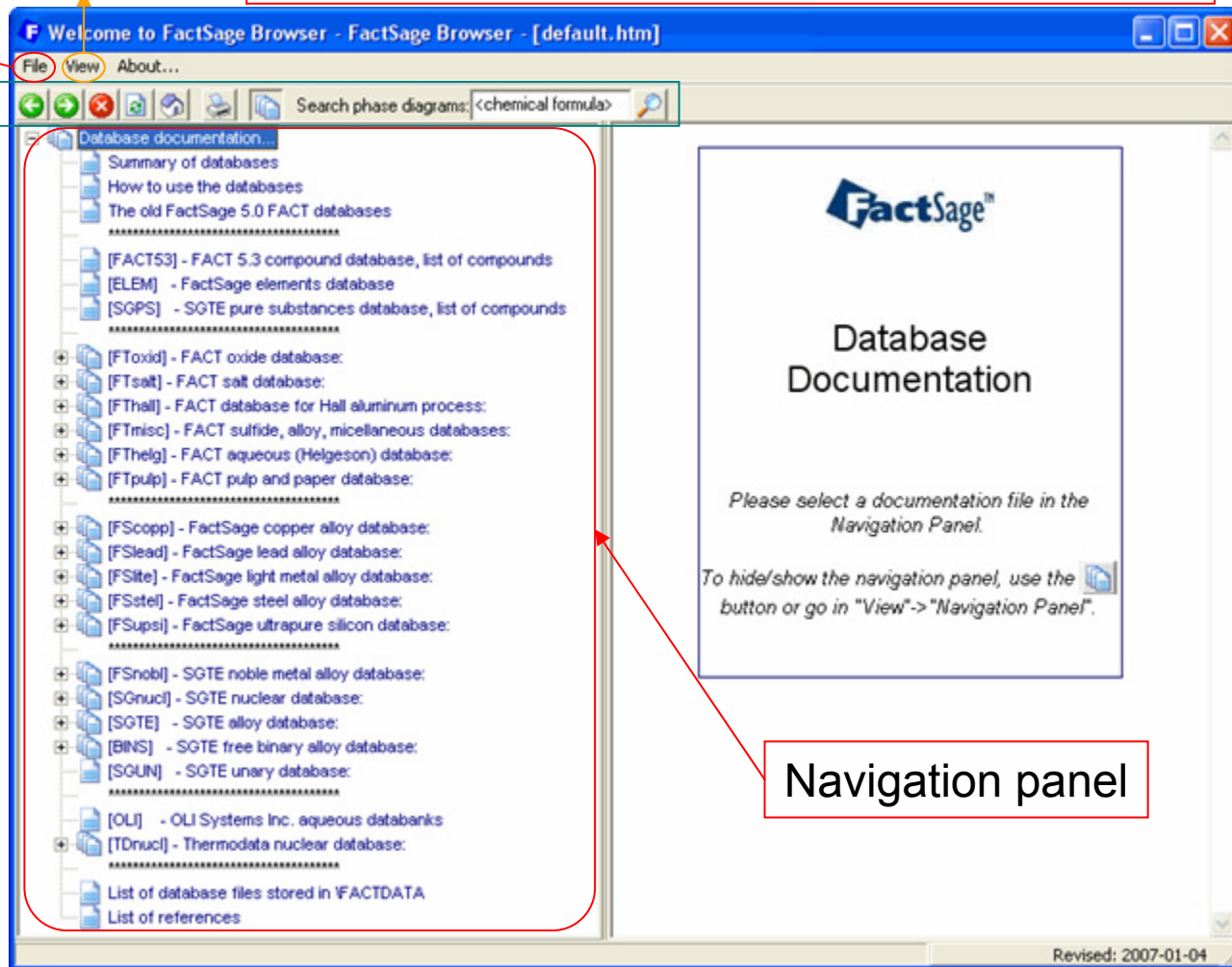
# The *FactSage Browser*



Show/hide the navigation panel

Show/hide the Search phase diagrams box and button

Show/hide the preview window (for phase diagrams)



## Navigation toolbar

- Back
- Forward
- Stop
- Refresh
- Home
- Print
- View Navigation Panel
- Search phase diagrams

Navigation panel

# Summary of Databases

**FactSage Summary of Databases - FactSage Browser - [FSData.htm]**

File View About..

Search phase diagrams: <chemical formul>

**Database documentation...**

- Summary of databases
- How to use the databases
- The old FactSage 5.0 FACT databases
- [FACT53] - FACT 5.3 compound database, list of compounds
- [ELEM] - FactSage elements database
- [SGPS] - SGTE pure substances database, list of compounds
- [FToxid] - FACT oxide databases:
- [FTsalt] - FACT salt database:
- [FTHall] - FACT database for Hall aluminum process:
- [FTmisc] - FACT sulfide, alloy, miscellaneous databases:
- [FTHelg] - FACT aqueous (Helgeson) database:
- [FTpulp] - FACT pulp and paper database:
- [FScopp] - FactSage copper alloy database:
- [FSlead] - FactSage lead alloy database:
- [FSlite] - FactSage light metal alloy database:
- [FSstel] - FactSage steel alloy database:
- [FSupsi] - FactSage ultrapure silicon database:
- [FSnobl] - SGTE noble metal alloy database:
- [SGnucl] - SGTE nuclear database:
- [SGTE] - SGTE alloy database:
- [BINS] - SGTE free binary alloy database:
- [SGUN] - SGTE unary database:
- [OLI] - OLI Systems Inc. aqueous databanks
- [TDnucl] - Thermodata nuclear database:
- List of database files stored in FACTDATA
- List of references

**Compound Databases :**

- FACT53** - FACT 5.3 compound database
- SGPS** - SGTE pure substances database

**Coupled Compound & Solution Databases :**

**Fact Package:**

- FToxid** - oxide database for slags, glasses, ceramics, refractories
- FTsalt** - salt database
- FTHall** - Hall aluminum database
- FTHelg** - aqueous (Helgeson) database
- FTmisc** - miscellaneous databases for sulfides, alloys, etc.
- FTpulp** - pulp and paper database (and corrosion and combustion)

**FactSage<sup>®</sup> Databases:**

- FScopp** - copper alloy database
- FSlead** - lead alloy database
- FSlite** - light metal database
- FSstel** - steel database
- FSupsi** - ultrapure silicon database

**SGTE Databases :**

- FSnobl** - noble metal database
- SGnucl** - nuclear database
- SGTE** - (2004) alloy database
- BINARY** - (2004) free alloy database

**Other Databases:**

- OLI-Systems** aqueous databases
- TDNucl** - Thermodata nuclear database

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# How to use the *databases* with *FactSage*

This section is for both *beginners* and *experienced* users.

The screenshot shows a web browser window titled "FactSage Database documentation - FactSage Browser - [Database\_Documentation.htm]". The left sidebar displays a tree view of the database documentation, with "How to use the databases" highlighted in a red oval. The main content area displays the title "HOW TO USE THE DATABASES - January, 2007" and a "Table of Contents" section. The table of contents lists the following sections:

- 1.0 INTRODUCTION**
  - 1.1 Overview
  - 1.2 References
- 2.0 THE OLD FACT FS50 DATABASES**
  - 2.1 Why you may still require the old databases:
  - 2.2 FACT (FS50Base.cdb) compound database:
  - 2.3 FACT (FS50Soln.sda) database
- 3.0 THE PRESENT FACT DATABASES**
  - 3.1 Corresponding solution and compound databases:
    - 3.1.1 Recommended procedure for species selection
    - 3.1.2 Database naming convention
  - 3.2 The FACT53 (FS53Base.cdb) general compound database
  - 3.3 FToxid (FToxid53Soln.sda) solution database:  
FToxid (FToxid53Base.cdb) compound database:
  - 3.4 FTsalt (FTsalt53Soln.sda) solution database:  
FTsalt (FTsalt53Base.cdb) compound database:
  - 3.5 FThall (FThall53Soln.sda) solution database:  
FThall (FThall53Base.cdb) compound database:
  - 3.6 FTmisc (FTmisc53Soln.sda) solution database:  
FTmisc (FTmisc53Base.cdb) compound database:
  - 3.7 FThelg (FThelg53Soln.sda) solution database:  
FThelg (FThelg53Base.cdb) compound database:
  - 3.8 FTPulp (FTPulp53Soln.sda) solution database:  
FTPulp (FTPulp53Base.cdb) compound database:

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# Expanded tree view for a database

- general description
- list of compounds and solutions  
or list of optimized systems and calculated binary phase diagrams
- description of solutions
- phase diagrams

**FactSage FSstel Steel Database**  
**List of systems and phases**

The following tables summarise the contents of the FactSage FSstel Steel Database in terms of the systems and phases it includes. The listings assist in phase selection for particular calculations by providing

- A LIST OF ALL THE UNARY, BINARY, TERNARY AND QUATERNARY SYSTEMS WHICH HAVE BEEN ASSESSED
- A LIST OF ALL ASSESSED PHASES IN EACH OF THE SYSTEMS
- ASSISTANCE WITH PHASE SELECTION

**Phase diagrams have been calculated for all the binary systems using the assessed parameters contained in the database. The diagram for a particular binary system can be viewed by clicking on the system as listed in Table 2 below. The diagrams contain the names of the stable phases in each system and thus provide guidance in phase selection for calculations in higher-order systems.**

The phases listed for the binary and higher order systems may be solution phases or stoichiometric intermetallic compound phases (ST).

Use of the FactSage module VIEW DATA with FSstel compound and solution databases allows inspection of a phase listing for a defined combination of elements.

When searching for a particular system in the present four lists, use alphabetical order of the elements.

References to individual system assessments are provided after the tables.

# List and Preview

There are lists of optimized binary phase diagrams complete with the phase selection and a preview of the phase diagram (option **View > Preview Figure** checked).

FactSage steel database - list of systems and phases - FactSage Browser - [FSstel\_list.htm]

File View About... Search phase diagrams: <chemical formula>

**Table 2: List of phases for BINARY systems**

Complete assessments are available for the systems listed below.  
 Click on the system name to view the stable phase diagram calculated with the stored parameters.

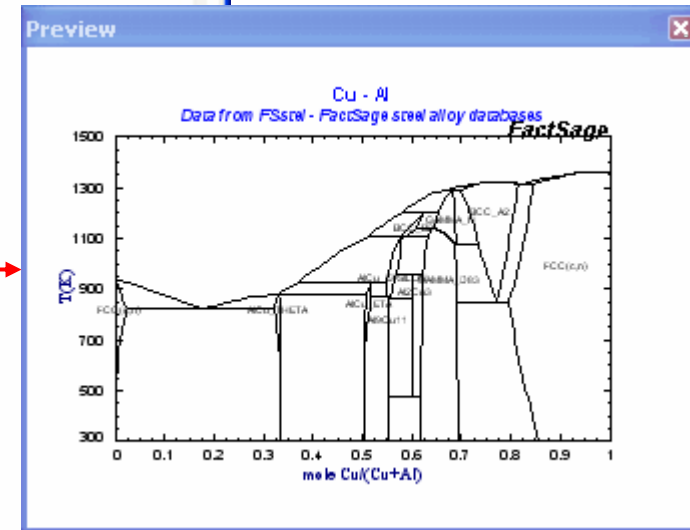
Phases accompanied by ST in parenthesis indicate a stoichiometric phase. These phases must be selected from the FSstel compound base.

**(I-option)** – the phase displays a miscibility gap or is an ordered phase; selection with the I-option required.  
**(J-option)** – the phase displays 2 miscibility gaps or special ordering effects and must be selected with the J-option.

<b>Al-C</b>				
LIQUID	FCC_A1	C(S)	AL4C3(ST)	
<b>Al-Ca</b>				
LIQUID	FCC_A1	BCC_A2	AL2CA(ST)	AL4CA(ST)
<b>Al-Cr</b>				
LIQUID	FCC_A1	BCC_A2	AL13CR2(ST)	AL11CR2(ST)
AL4CR(ST)	AL9CR4(ST)	AL8CR5(ST)	ALCR2(ST)	
<b>Al-Cu</b>				
LIQUID	FCC_A1	BCC_A2	ALCU_THETA	ALCU_EPSILON
ALCU_ETA	BCC_B2	GAMMA_D83	GAMMA_H	AL9CU11(ST)
AL2CU3(ST)				
<b>Al-Fe</b>				
LIQUID	AL13FE4	AL2FE(ST)	AL5FE2(ST)	AL5FE4
BCC_B2(I-option)	FCC_A1	BCC_A2		
<b>Al-Mn</b>				
LIQUID	FCC_A1	BCC_A2	CUB_A13	CBCC_A12
HCP_A3	AL8MN5	AL12MN(ST)	AL6MN(ST)	AL4MN(ST)
AL11MN4(ST)				

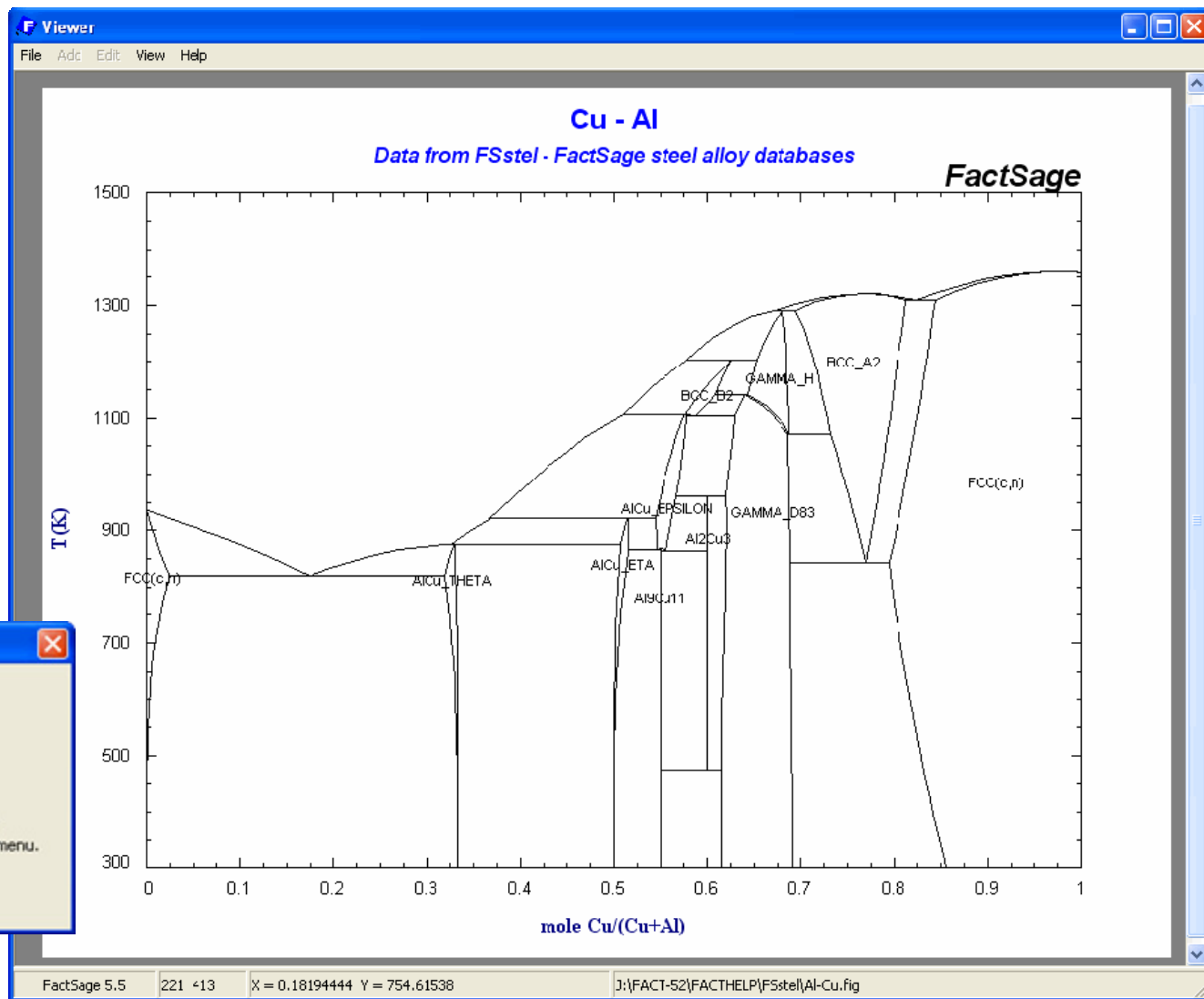
J:\FACT-S2\FACTHELP\FSstel\Al-Cu.fig

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# Viewer

For example, a click on [Al-Cu](#) in the previous slide opens a **Viewer** window.



**Information**

**VIEWER**

This is the VIEWER version of the FIGURE program of the FactSage software ([www.Factsage.com](http://www.Factsage.com)).

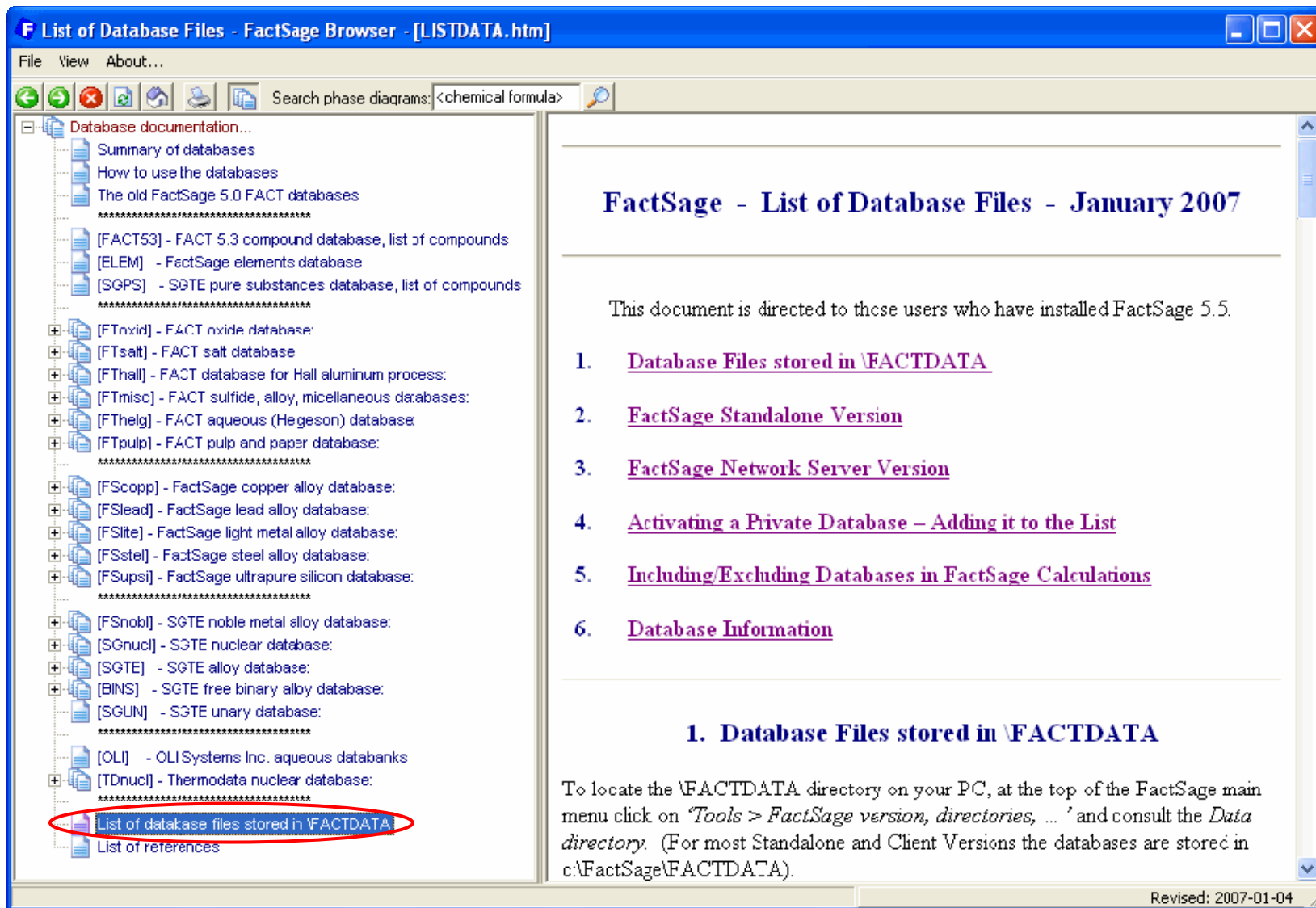
Figures cannot be modified/saved by VIEWER.

If you are a FactSage subscriber you may edit the figure by calling the FIGURE program from the FactSage main menu.

OK



# List of database files stored in /FACTDATA



The screenshot shows the FactSage Browser interface. The left pane displays a tree view of database documentation, with the file "List of database files stored in \FACTDATA" highlighted in red. The right pane displays the content of this file, which is a document titled "FactSage - List of Database Files - January 2007".

**FactSage - List of Database Files - January 2007**

This document is directed to those users who have installed FactSage 5.5.

- [1. Database Files stored in \FACTDATA](#)
- [2. FactSage Standalone Version](#)
- [3. FactSage Network Server Version](#)
- [4. Activating a Private Database – Adding it to the List](#)
- [5. Including/Excluding Databases in FactSage Calculations](#)
- [6. Database Information](#)

**1. Database Files stored in \FACTDATA**

To locate the \FACTDATA directory on your PC, at the top of the FactSage main menu click on *Tools > FactSage version, directories, ...* and consult the *Data directory*. (For most Standalone and Client Versions the databases are stored in c:\FactSage\FACTDATA).

Revised: 2007-01-04

# List of references

The screenshot shows the FactSage Browser interface. The title bar reads "F FACT reference list - FactSage Browser - [FACT\_reference\_list.htm]". The menu bar includes "File", "View", and "About...". The search bar contains "chemical formula". The left sidebar shows a tree view of database documentation, with "List of references" highlighted and circled in red. The main content area displays the following text:

## FACT GENERAL REFERENCES – JANUARY, 2007

[0001] FACT, [www.crct.polymtl.ca](http://www.crct.polymtl.ca)

[0002] C.W. Bale, P. Chartrand, S.A. Decterov, G. Eriksson, K. Hack, R. Ben Mahfoud, J. Melançon, A.D. Pelton and S. Petersen, "FactSage Thermochemical Software and Databases", *Calphad Journal*, **62**, 189-228 (2002).

[0003] C.W. Bale, A.D. Pelton and W.T. Thompson, "An Efficient Procedure for Computing Isothermal Predominance Diagrams", *Can. Met. Quart.*, **25**, 107-112 (1986).

[0004] A.D. Pelton, W.T. Thompson, C.W. Bale and G. Eriksson, "FACT Thermochemical Databases for Calculations in Materials Chemistry at High Temperatures", *High Temp. Science*, **26**, 231-250 (1990).

[0005] C.W. Bale, W.T. Thompson, A.D. Pelton, G. Eriksson, P.K. Talley and J. Melancon, "Recent Developments in the FACT System", *Proc. Int'l Symp. on Computer Databases, CIM*, (1993).

[0006] W.T. Thompson, G. Eriksson, C.W. Bale and A.D. Pelton, "Applications of FACT in High Temperature Materials Chemistry", *Proc. 9th IUPAC Int'l Conf. High Temp. Mats. HTMC IX, Penn. State Univ., Electrochem. Soc. Proc.*, Vol. 97-39, ed K. Spear, pp. 16-30 (1997). ISBN 1-56677-190-0.

## THEORY / MODELING

[1001] A.D. Pelton, "Calculation of a Binary Solidus When Only the Liquidus and Minimal Thermodynamic Information are Known", *Ber. Bunsenges. phys. Chem.*, **84**, 212-17 (1980).

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# Search phase diagrams – elements

Enter the components – **elements** or **compounds** – in the **Search phase diagrams text box** and click on the **Search button** to scan the documentation for phase diagrams containing at least one of the components.

The screenshot shows the FactSage Browser interface. The title bar reads 'F Search Results - FactSage Browser - [search\_results.htm]'. The search bar contains the text 'Search phase diagrams: Al Si O'. Below the search bar, a list of phase diagrams is displayed under the heading 'Search results for: Al Si O'. The list includes various alloy systems such as Al-Si-Ca, Al-Si-Fe, Al-O, Al-Si, O-Si, Ag-Al, Ag-Si, Al-As, Al-Au, Al-B, Al-Ba, Al-Bi, Al-C, Al-Ca-Fe, Al-Ca, Al-Ce, Al-Cr, and Al-Cu-Fe, each with associated database identifiers like FSstel, TDnucl, FSlite, SGTE, and FSnobl. The left sidebar shows a tree view of database documentation, and the bottom status bar indicates 'Revised: 2007-C1-04'.

Shown here is an example with 3 elements: **Al**, **Si** and **O**.

# Search phase diagrams – compounds

Shown here is an example with 2 compounds:  $\text{Al}_2\text{O}_3$  and  $\text{SiO}_2$ .

The screenshot shows the FactSage Browser interface with the search results for  $\text{Al}_2\text{O}_3$  and  $\text{SiO}_2$ . The search query is entered as "Al2O3 SiO2". The left pane shows the database documentation tree, and the right pane displays the search results for phase diagrams.

**Search Results for:  $\text{Al}_2\text{O}_3$   $\text{SiO}_2$**

**List of Phase Diagrams:**

- CaO -  $\text{Al}_2\text{O}_3$  -  $\text{SiO}_2$  /1200C: | FToxid |
- CaO -  $\text{Al}_2\text{O}_3$  -  $\text{SiO}_2$  /1400C: | FToxid |
- CaO -  $\text{Al}_2\text{O}_3$  -  $\text{SiO}_2$  /1600C: | FToxid |
- MgO -  $\text{Al}_2\text{O}_3$  -  $\text{SiO}_2$  /1300C: | FToxid |
- MgO -  $\text{Al}_2\text{O}_3$  -  $\text{SiO}_2$  /1400C: | FToxid |
- MgO -  $\text{Al}_2\text{O}_3$  -  $\text{SiO}_2$  /1500C: | FToxid |
- MgO -  $\text{Al}_2\text{O}_3$  -  $\text{SiO}_2$  /1800C: | FToxid |
- $\text{Al}_2\text{O}_3$  -  $\text{SiO}_2$  : | FToxid |
- CaO - MgO -  $\text{Al}_2\text{O}_3$  /1200C: | FToxid |
- CaO - MgO -  $\text{Al}_2\text{O}_3$  /1400C: | FToxid |
- CaO - MgO -  $\text{Al}_2\text{O}_3$  /1725C: | FToxid |
- CaO - MgO -  $\text{Al}_2\text{O}_3$  /1900C: | FToxid |
- $\text{AlO}_{1.5}$  -  $\text{SiO}_2$  | TDnucl |
- $\text{BO}_{1.5}$  -  $\text{SiO}_2$  : | TDnucl |
- BaO -  $\text{SiO}_2$  : | TDnucl |
- CaO -  $\text{Al}_2\text{O}_3$  : | FToxid |
- CaO - MgO -  $\text{SiO}_2$  /1200C: | FToxid |
- CaO - MgO -  $\text{SiO}_2$  /1300C: | FToxid |
- CaO - MgO -  $\text{SiO}_2$  /1400C: | FToxid |
- CaO - MgO -  $\text{SiO}_2$  /1500C: | FToxid |
- CaO - MgO -  $\text{SiO}_2$  /1600C: | FToxid |
- CaO - MgO -  $\text{SiO}_2$  /1700C: | FToxid |

Revised: 20C7-01-04