

27. Excel Add-In Functions

27.1 Getting started

With HSC 7.0 Add-In Functions it is possible to use the HSC 7.0 database directly under Microsoft Excel and in that way carry out several thermochemical and other type of calculations. In order to use these functions in Excel they must, however, first be activated. Three stages may be needed to activate HSC functions in Excel. The number of stages needed depends on the computer settings and Windows and Excel versions.

Activation Stage 1:

1. Open Excel 2000 (NOTE: HSC Add-Ins may not work under earlier Excel versions!)
2. Select “**Tools, Add-Ins...**” from the menu.
3. Select “**Browse...**” and locate **HSC7.XLL** from your **HSC7\AddIns** folder.
4. Select “**HSC 7.0 Functions**” and press “**OK**”, see Figure 1. It may be necessary to restart Excel in order for the add-in functions to work.

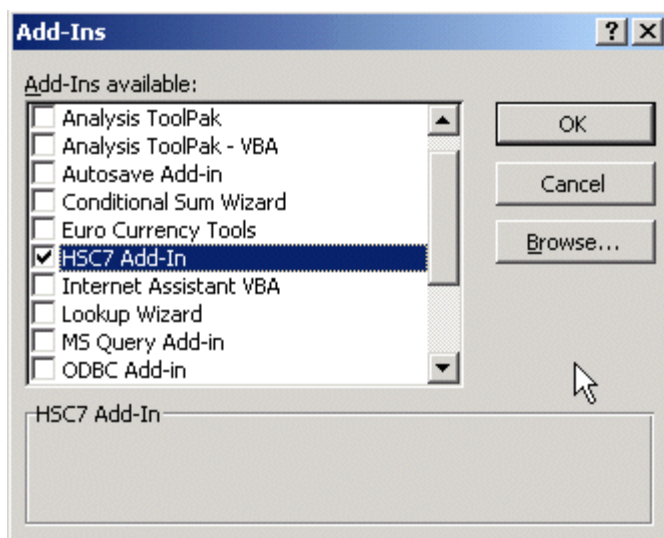


Figure 1: Adding/removing HSC 7.0 Functions under Excel *Please do NOT select old HSC 6 Functions!*

Activation Stage 2 (Optional):

If the installation is unsuccessful, the following steps may help:

1. Start the VBA Editor by pressing Alt+F11.
(or select Tools, Macro, Visual Basic Editor, ...)
2. Select “**Tools, References**” from the menu.
3. Select “**Browse...**” and locate **HSC7.XLL** from your HSC directory (for example C:\HSC7\HSC7.XLL). It may be necessary to restart Excel in order for the add-in functions to work. HSC Add-In functions locate in HSC7.DLL, however, Excel calls

these functions through HSC7.XLL interface.

4. See also stage 3 in Chapter 27.2 if needed.

The HSC installation routine automatically takes care of the HSC7.DLL registration.

Activation Stage 3 (Optional):

1. During opening, answer **No** when prompted by Excel to update all linked information (automatic link updates do not work due to some bug in MS Excel).
2. Select **“Edit, Links”** from the menu.
3. Choose the path containing **HSC7.XLL** from the listbox and press **“Change Source”**.
4. Browse to your **HSC7\AddIns** folder and choose **HSC7.XLL**.

27.2 Updating XLS-Files which use old HSC 5.1 Add-In Functions

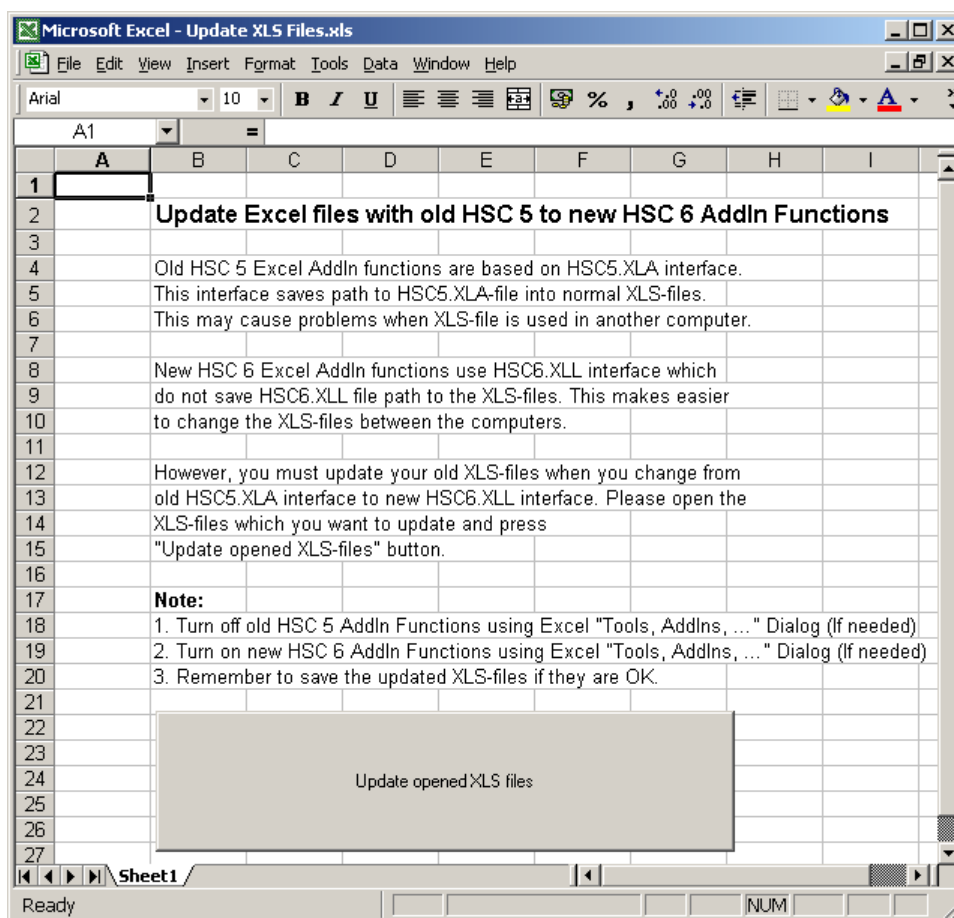


Figure 2: Update XLS Files.xls macro may be used to update old Excel files with HSC

Roine, Lamberg, Ilola

September 9, 2009

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5.1 Add-In functions to HSC 6.0 or 7.0 Add-Ins.

You must update old Excel files with HSC 5.1 Add-In functions. If you find following type formulas from your Excel spreadsheet then you must update:

=C:\HSC5\AddIns_BackUp\HSC5.xla!H(D11;E11)

HSC 5.1 use old HSC5.XLA interface, HSC 6.0 or 7.0 Add-Ins use better HSC7.XLL interface which makes the use of these files much more easier because the path to the HSC7.XLL files is not saved into the XLS-file cells!

27.3 Brief Description of the Functions

The "AddInSample.xls" sample file offers the fastest way to start using HSC 7 Add-In functions, you may find it from HSC 7 folder, such as:

C:\HSC7\AddIns\AddInSample.xls

The add-in functions are used the same way as functions in general under MS Excel. For example by writing "**=H(A1;A2)**" the enthalpy for the species in cell A1 and at the temperature in cell A2, is returned. To view all existing functions simply select "**Insert, Function**" from the main menu and then choose "**User Defined**" from the left listbox. The right listbox will now give show all available HSC functions and their arguments. A complete description of the functions is given in the following tables 1 and 2.

A useful Excel example file is located in the catalogue "\AddIns" in your HSC installation directory. The example, called "AddInSample.xls", can be viewed after the add-ins have been made available (described in Chapter 27.1). Figure 3 shows what the example file should look like using MS Excel 2000.

The functions are all collected in the column "Function" and their return values under "Return value". A red font indicates the input values with a short description of every function shown to the right. This example provides an easy method for testing the functions and also provides practice in learning how to use them.

HSC Add-In Functions - Species Based	
Functions	Descriptions (Return values)
General	
Description (Return value):	
UNITS(T;E)	Changes the temperature and energy units
BAL(Equation)	Balanced reaction equation
SPECIES(DBNo,Position)	Species formula in given database and record number
Species	
Description (Return value):	
H(Species;T)	Enthalpy (per kmol) of species at given temperature
HKG(Species;T)	Enthalpy (per kg) of species at given temperature
HNM3 or HCM(Species;T)	Enthalpy (per Nm ³) of species at given temperature
HLAT(Species;T)	Enthalpy excluding phase transformations (per mol) of species at given temperature
S(Species;T)	Entropy (per M mol) of species at given temperature
CP(Species;T)	Heat capacity (per M mol) of species at given temperature
G(Species;T)	Gibbs energy (per kmol) of species at given temperature
Reaction equation	
Description (Return value):	
H(Equation;T)	Enthalpy difference (per kmol) of reaction equation at given temperature.
HKG(Equation;T)	Enthalpy difference (per kg) of reaction equation at given temperature
S(Equation;T)	Entropy difference (per M mol) of reaction equation at given temperature
CP(Equation;T)	Heat capacity difference (per M mol) of reaction equation at given temperature
G(Equation;T)	Gibbs energy difference (per kmol) of reaction equation at given temperature
K(Equation;T)	Equilibrium constant of reaction equation at given temperature
Iteration (reverse)	
Description (Return value):	
TATH(Species;H)	Temperature of species at given enthalpy (per kmol)
TATHKG(Species;H)	Temperature of species at given enthalpy (per kg)
TATHNM3 or TATHCM(Species;H)	Temperature of species at given enthalpy (per Nm ³)
TATHLAT(Species;H)	Temperature of species (per kmol) at given enthalpy excluding phase transformations
TATS(Species;S)	Temperature of species at given entropy (per M mol).
TATCP(Species;CP)	Temperature of species at given heat capacity (per M mol)
TATG(Species;G)	Temperature of species at given Gibbs energy (per kmol)
Temp. independent	
Description (Return value):	
STRUCT(Species)	Structural formula of given species
CHNAME(Species)	Chemical name of given species
CONAME(Species)	Common name of given species
CAN(Species)	Chemical abstract number of given species
MW(Species)	Molecular weight of given species [kg/kmol]
DE(Species)	Density of given species [kg/l]
MP(Species)	Melting point of given species
BP(Species)	Boiling point of given species
PHASE(Species)	Phase type of given species
RGBCOLOR(Species)	RGB color code of given species
REF(Species)	Reference of given species
REL(Species)	Reliability class of given species
Percentage	
Description (Return value):	
MOLP(Species1;Species2)	Species 1 content in Species 2 in mol-%
WTP(Species1;Species2)	Species 1 content in Species 2 in wt-%
Cp-function related	
Description (Return value):	
CPFUNCTION(Species)	Heat capacity (Cp) polynomial function of given species
CPA(Species)	A coefficient in Cp-function of given species
CPB(Species)	B coefficient in Cp-function of given species
CPC(Species)	C coefficient in Cp-function of given species
CPD(Species)	D coefficient in Cp-function of given species
TMIN(Species)	Lower limit of Cp-function temperature range
TMAX(Species)	Upper limit of Cp-function temperature range

Table 1: Description of all currently available HSC Species based add-in functions.

HSC Add-In Functions - Stream Based	
Functions	Descriptions (Return values)
Stream/Flow	
STREAM H (Species; Amount; T) FLOW H (Species; Amount; T)	Enthalpy of the specified stream/flow (species in kmol) at given temperature
STREAM H KG (Species; Amount; T) FLOW H KG (Species; Amount; T)	Enthalpy of the specified stream/flow (species in kg) at given temperature
STREAM H NM 3 (Species; Amount; T) FLOW H NM 3 (Species; Amount; T)	Enthalpy of the specified stream/flow (species in Nm ³) at given temperature
STREAM H LAT (Species; Amount; T) FLOW H LAT (Species; Amount; T)	Enthalpy excluding phase transformations of the specified stream/flow (species in kmol) at given temperature
STREAM S (Species; Amount; T) FLOW S (Species; Amount; T)	Entropy of specified stream/flow (species in M mol) at given temperature
STREAM CP (Species; Amount; T) FLOW CP (Species; Amount; T)	Heat capacity of specified stream/flow (species in M mol) at given temperature
STREAM G (Species; Amount; T) FLOW G (Species; Amount; T)	Gibbs energy of specified stream/flow (species in kmol) at given temperature
Density A (Species; Amount; T)	Density of aqueous solution (kg/m ³) Arg. 2 = Weight fractions, max = 1, Arg. 3 = temperature °C
Stream/Flow Iteration (reverse)	
STREAM TH (Species; Amount; H; T min; T max) FLOW TH (Species; Amount; H; T min; T max)	Temperature of stream/flow (species in kmol) at given enthalpy between T min and T max Outside range returns #VALUE!
STREAM TH KG (Species; Amount; H; T min; T max) FLOW TH KG (Species; Amount; H; T min; T max)	Temperature of stream/flow (species in kg) at given enthalpy between T min and T max Outside range returns #VALUE!
STREAM TH NM 3 (Species; Amount; H; T min; T max) FLOW TH NM 3 (Species; Amount; H; T min; T max)	Temperature of stream/flow (species in Nm ³) at given enthalpy between T min and T max Outside range returns #VALUE!
STREAM TH LAT (Species; Amount; H; T min; T max) FLOW TH LAT (Species; Amount; H; T min; T max)	Temperature of stream/flow (species in kmol) at given enthalpy excluding phase transformations between T min and T max Outside range returns #VALUE!
STREAM TS (Species; Amount; S; T min; T max) FLOW TS (Species; Amount; S; T min; T max)	Temperature of stream/flow (species in M mol) at given entropy between T min and T max Outside range returns #VALUE!
STREAM TCP (Species; Amount; CP; T min; T max) FLOW TH (Species; Amount; H; T min; T max)	Temperature of stream/flow (species in M mol) at given heat capacity between T min and T max Outside range returns #VALUE!
STREAM TG (Species; Amount; G; T min; T max) FLOW TG (Species; Amount; G; T min; T max)	Temperature of stream/flow (species in kmol) at given gibbs energy between T min and T max Outside range returns #VALUE!
Equilibrium Compositions	
Stream EQ (Species; Input; Output, T, P)	Equilibrium amounts of species based on given amounts, temperature and pressure.

Table 2: *Description of all currently available HSC Stream based add-in functions.*

Microsoft Excel - AddInSample.xls							
File Edit View Insert Format Tools Data Window Help							
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B107 =							
A	B	C	D	E	F	G	H
18	Reaction equation	Return Value	Argument 1	Arg. 2	Arg. 3	Arg. 4	Arg. 5
19	H(Equation;T)	-485.132	2H2(g) + O2(g) = 2H2O(g)	100			
20	HKG(Equation;T)	-13.465	2H2(g) + O2(g) = 2H2O(g)	100			
21	S(Equation;T)	-93.276	2H2(g) + O2(g) = 2H2O(g)	100			
22	CP(Equation;T)	-19.295	2H2(g) + O2(g) = 2H2O(g)	100			
23	G(Equation;T)	-450.326	2H2(g) + O2(g) = 2H2O(g)	100			
24	K(Equation;T)	1.105E+63	2H2(g) + O2(g) = 2H2O(g)	100			
25	Iteration (reverse)	Return Value	Argument 1	Arg. 2	Arg. 3	Arg. 4	Arg. 5
26	TATH(Species;H)	5046.97	CO2(g)	-93.35			
27	TATHKG(Species;H)	1191.85	FeS	-0.26			
28	TATHNM3 or TATHCM(Species;H)	42.94	N2(g)	0.02			
29	TATHLAT(Species;H)	25.00	H2O(l)	0.00			
30	TATS(Species;S)	-138.85	H2O(l)	20.77			
31	TATCP(Species;CP)	137.99	CH4(a)	49.04			
32	TATG(Species;G)	-204.93	He(g)	-11.29			
33	Stream/Flow	Return Value	Argument 1	Arg. 2	Arg. 3	Arg. 4	Arg. 5
34	STREAMH(Species;Amount;T)	5.723	Fe	1	100		
35	FLOWH(Species;Amount;T)		Cu	1			
36			Zn	1			
37	STREAMHKG(Species;Amount;T)	6.364	Cu(+2a)	21.85	100		
38	FLOWHKG(Species;Amount;T)		Fe(+2a)	6.72			
39			Zn(+2a)	2			
40	STREAMHNM3(Species;Amount;T)	2.187	N2(g)	17.78	100		
41	FLOWHNM3(Species;Amount;T)		O2(g)	4.79			
42			Ar(g)	0.23			
43	STREAMHLAT(Species;Amount;T)	14.060	Cu2S	1	100		
44	FLOWHLAT(Species;Amount;T)		FeS	1			
45			ZnS	1			
46	STREAMS(Species;Amount;T)	200.629	N2(g)	0.78	100		
47	FLOWS(Species;Amount;T)		O2(g)	0.21			
48			Ar(g)	0.01			
49	STREAMCP(Species;Amount;T)	29.252	N2(g)	0.78	100		
50	FLOWCP(Species;Amount;T)		O2(g)	0.21			
51			Ar(g)	0.01			
52	STREAMG(Species;Amount;T)	-72.677	N2(g)	0.78	100		
53	FLOWG(Species;Amount;T)		O2(g)	0.21			
54			Ar(g)	0.01			
55	DensityA(Species;Amount;T)	1260.348	NaCl	0.2	50		
56			FeSO4	0.1			
57							
58	Stream/Flow iteration (reverse)	Return Value	Argument 1	Arg. 2	Arg. 3	Arg. 4	Arg. 5
59	STREAMTH(Species;Amount;H;Tmin;TMax)	100.00	Fe	1	5.72	0	1000
60	FLOWTH(Species;Amount;H;Tmin;TMax)		Cu	1			
61			Zn	1			
62	STREAMTHKG(Species;Amount;H;Tmin;TMax)	100.00	Cu(+2a)	21.85	6.36	0	1000
63	FLOWTHKG(Species;Amount;H;Tmin;TMax)		Fe(+2a)	6.72			
64			Zn(+2a)	2			
65	STREAMTHNM3(Species;Amount;H;Tmin;TMax)	100.00	N2(g)	17.77905	2.19	0	1000
66	FLOWTHNM3(Species;Amount;H;Tmin;TMax)		O2(g)	4.786145			
67			Ar(g)	0.227884			
68	STREAMTHLAT(Species;Amount;H;Tmin;TMax)	100.00	Cu2S	1	14.06	0	1000
69	FLOWTHLAT(Species;Amount;H;Tmin;TMax)		FeS	1			
70			ZnS	1			
71	STREAMTS(Species;Amount;S;Tmin;TMax)	100.00	N2(g)	0.78	200.63	0	1000
72	FLOWTS(Species;Amount;S;Tmin;TMax)		O2(g)	0.21			
73			Ar(g)	0.01			
74	STREAMTCP(Species;Amount;CP;Tmin;TMax)	100.00	N2(g)	0.78	29.25	0	1000
75	FLOWTCP(Species;Amount;CP;Tmin;TMax)		O2(g)	0.21			
76			Ar(g)	0.01			
77	STREAMTG(Species;Amount;G;Tmin;TMax)	100.00	N2(g)	0.78	-72.68	0	1000
78	FLOWTG(Species;Amount;G;Tmin;TMax)		O2(g)	0.21			
79			Ar(g)	0.01			

Figure 3: Example including all available Excel add-in functions (AddInSample.xls).

27.4 Stream Equilibrium Function (Array Functions)

The array functions are created in different way than normal spreadsheet functions. The most important array function of HSC-Sim is **StreamEQ** which calculates the amounts of species in the equilibrium state at given temperature and pressure.

	A	B	C	D	E
1	Temperature		1500 °C		
2	Pressure		1 bar		
3	SPECIES:	Input	Output		
4	§ PHASE 1:	25		°C	
5	CO(g)	0		mol	
6	CO2(g)			mol	
7	N(g)			mol	
8	N2(g)	3.02		mol	
9	NO(g)			mol	
10	N2O3(g)			mol	
11	N2O4(g)			mol	
12	N2O5(g)			mol	
13	O2(g)	0.8		mol	
14	§ PHASE 2:	25		°C	
15	C	1		mol	
16					

Fig. 4. Selection for array function.

You may create array function in MS Excel and HSC-Sim using the same procedure:

1. Create continuous list of phases and species in one column. Important: The phase name string must always start with §-character, Fig. 4.
2. Specify temperatures of the phases into the next column on the §-phase-row.
3. Specify the input amounts (moles) of the species into the next column.
4. Select array function cell range, see Fig. 4.
5. Type array function: =StreamEQ(A4:A15;B4:B15;C1;C2), Fig. 5.
6. Keep Ctrl + Shift keys down and press Enter, Fig. 6.
7. The array function is ready if it is within brackets, Fig. 6.

Please note that the array function cell range must be continuous, it is like a solid and fixed block within spreadsheet. Do not brake off this cell range with uncontinuous copy-

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paste, insert rows, delete rows, etc. operations.

SUM		X	✓	=	=StreamEQ(A4:A15;B4:B15;C1;C2)				
	A	B	C	D	E				
1	Temperature		1500	°C					
2	Pressure		1	bar					
3	SPECIES:	Input	Output						
4	§ PHASE 1:	25	C1;C2)	°C					
5	CO(g)	0		mol					
6	CO2(g)			mol					
7	N(g)			mol					
8	N2(g)	3.02		mol					
9	NO(g)			mol					
10	N2O3(g)			mol					
11	N2O4(g)			mol					
12	N2O5(g)			mol					
13	O2(g)	0.8		mol					
14	§ PHASE 2:	25		°C					
15	C	1		mol					
16									

Fig. 5. Type array function.

C4		={StreamEQ(A4:A15;B4:B15;C1;C2)}							
	A	B	C	D	E				
1	Temperature		1500	°C					
2	Pressure		1	bar					
3	SPECIES:	Input	Output						
4	§ PHASE 1:	25	1500	°C					
5	CO(g)	0	0.400008	mol					
6	CO2(g)		0.599992	mol					
7	N(g)		7.841E-11	mol					
8	N2(g)	3.02	3.0199962	mol					
9	NO(g)		7.531E-06	mol					
10	N2O3(g)		4.736E-23	mol					
11	N2O4(g)		2.878E-30	mol					
12	N2O5(g)		1.32E-36	mol					
13	O2(g)	0.8	2.171E-07	mol					
14	§ PHASE 2:	25	1500	°C					
15	C	1	0	mol					
16									

Fig. 6. Keep Ctrl + Shift keys down and press Enter.

27.5 Using the MineralProperty Add-In function

The add-in provides the MineralProperty Function. This function accesses the HSC Mineral Database (...HSC7\Geo\System\HscGeo7.mdb) and enables you to query the properties of the stored minerals.

The format for the formula is MineralProperty(<MineralName>, <PropertyName>).

As with any Excel functions you can use references and other formulas to provide the two parameters to the MineralProperty function, e.g MineralProperty(A1,B1), MineralProperty("Pyrite",B1) and so on. See the example workbook MineralProperty_examples.xls for more samples and information:

Available functions

The HSC add-in provides the following functions to facilitate access to the mineral properties.

Function	Parameters	Description
=MineralC(MN, EL)	MN=mineral name or mineral	Returns the weight-%
=MineralCode(MN)	MN=mineral name or mineral	returns the mineral
=MineralColor(MN)	MN=mineral name or mineral	Returns the color for
=MineralDensity(MN)	MN=mineral name or mineral	Returns the density
=MineralElementWt(MN;	MN=mineral name	See: MineralC
=MineralFormula(MN)	MN=mineral name or mineral	Returns the chemical
=MineralHardness(MN)	MN=mineral name or mineral	Returns the hardness
=MineralLuster(MN)	MN=mineral name	Returns the luster for
=MineralName(MN)	MN=Mineral symbol or mineral	Returns the mineral
=MineralProperty(MN;PR	MN=mineral name or mineral	returns any of the
=MineralSG(MN)	MN=mineral name or mineral	Returns the specific

MineralProperty

The MineralProperty function can be used to fetch the data from the fields in the <Mineralchemistry and Minerals tables for a given mineral. The available fields are listed below:

Data field	Explanation	Example
Code	The mineral symbol (ie.	=mineralproperty("Pyrite";"code")
Formula	Chemical formula of the	=mineralproperty("Pyrite";"formula")
Density		=mineralproperty("Pyrite";"density")
Hardness		=mineralproperty("Pyrite";"hardnes
Color		=mineralproperty("Pyrite";"color")
Luster		=mineralproperty("Pyrite";"luster")
Group		=mineralproperty("Pyrite";"group")
Chemical	These are returned in	=mineralproperty("Pyrite";"Fe")
Location	Sampling location or	=mineralproperty("Pyrite";"location
ID	The database ID of the	=mineralproperty("Pyrite";"ID")
Elements	A backslash delimited string	=mineralproperty("Pyrite";"element

Database The database in which the =mineralproperty("Pyrite";"databas

A sample excel sheet using the features of the add-in

Example of using HSC Chemistry Add-inn functions to create a table of minerals
 Pertti Lamberg, 8.7.2009, HSC Chemistry 7.0

	Mineral 1	Mineral 2	Mineral 3	Mineral 4	Mineral 3
Mineral	Pyrite	Py	PyPyhä	13988	13988
Code	Py	Py	Py	Py	Py
Formula	FeS2	FeS2	FeS2	FeS2	FeS2
Name	Pyrite	Pyrite	Pyrite	Pyrite	Pyrite
Cu	0.00	0.00	0.05	0.05	0.05
Zn	0.00	0.00	0.00	0.00	0.00
Fe	46.55	46.55	46.69	46.69	46.69
S	53.45	53.45	53.47	53.47	53.47
Density	5.01	5.01	5.01	5.01	5.01
Hardness	6.5	6.5	6.5	6.5	6.5
Color	yellow, pale brass	yellow, pale brass	yellow, pale brass	yellow, pale brass	yellow, pale brass
Luster	Metallic	Metallic	Metallic	Metallic	Metallic
Group					
Location	[stoichiometric]	[stoichiometric]	Pyhäsaalmi	Pyhäsaalmi	Pyhäsaalmi
ID	56	56	13988	13988	13988
Elements	FeS2	FeS2	FeS2	FeS2	FeS2
Database	HSC	HSC	HSC	HSC	HSC

HSC Command **Code example**

=MineralCode(B4) =MineralCode("Pyrite")
 =MineralFormula(B5) =MineralFormula("G")
 =MineralName(B7) =MineralName("Cu")
 =MineralC(B4;A8) =MineralC("Pyrite";"E")
 =MineralC(B\$6;\$A11) =MineralC("Galena";
 =MineralC(B\$6;\$A12) =MineralC("PY";"S")
 =MineralC(B\$6;\$A13) =MineralC("Kfs";"Al")
 =MineralProperty(B\$6;\$A14)

General HSC Command **MineralProperty(Mineral)**
 returns the property of given mineral
 Property can be any of the following
 -Code
 -Formula
 -Density
 -Hardness
 -Color
 -Luster
 -Group
 - and any of the chemical elements (e.g. Cu, Zn, Pb
 but in elemental form, not in oxide form (e.g. Si, N
 - Location
 - ID
 -Elements
 -Database

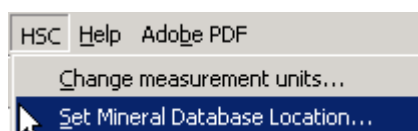
This column is copy paste-special values from the D-column to check the commands

You can get mineral properties by using
 - Mineral name (e.g. Pyrite)
 - Mineral Code (returns the mineral name abbreviation, e.g. Py)
 - Mineral Code (or Name) AND (part of the) Location (e.g. PyPyhä) (Returns the first matching)
 - Mineral ID (e.g. 1134) (Returns the mineral with ID-number)
 - Mineral Location

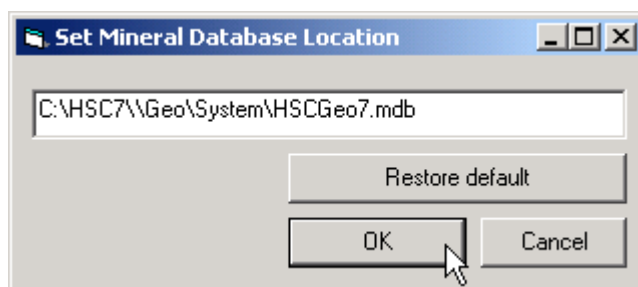
Changing HSC Mineral database in MS Excel

It is possible to use common mineral database within a network instead of default option where all have separate mineral databases locally installed in the computers. To use common database do the following:

1. Copy the database file ...HSC7\Geo\System\HscGeo7.mdb to a server where all users have access
2. In MS Excel select from the menu HSC – Set mineral database location



3. Type the location of the common database and press OK



4. To reset the database location back to the default one (...HSC7\Geo\System\HscGeo7.mdb) press Restore default
5. To use other than default mineral database in all the programs open

27.6 HSC AddIn Functions

Some of the AddIn functions are available on in HSC Chemistry spreadsheets but not in MS Excel. Currently the StreamX is such a function:

Function	StreamX
Syntax	StreamX(StremName;ParticlesRange;Variable)
Examples	StreamX(E\$6;\$E\$56:\$E\$97;\$B8) StreamX("ROM";\$E\$56:\$E\$97;"SiO2")
Explanation	Returns the value of the variable, e.g. SiO2 content of the stream calculated according to particles. Note that particle data can be corrected to be in harmony with chemical and mineral composition of the bulk feed.
Applications	StreamX functions is used in Mineral Based Models

Other HSC AddIn functions are StreamX, **RecoveryX**, **ParticleRecX**, **FractionX**, **MineralX**. These are described in more details in chapter "57. Mineral Based Models".

27.7 More about registering DLL Files

The HSC 7.0 installation routine should take care of all necessary DLL registrations. When selecting/deselecting the HSC 7.0 add-in using Excel, HSC7.DLL is automatically registered/unregistered. However, it is also possible to register/unregister the HSC7.DLL file manually. The program to achieve this is called Regsvr32.exe^{*)} and registration is completed using the following method:

Note: For other HSC6 installation paths than C:\HSC6, simply use your path instead in the instructions below.

1. Select **“Start, Run...”** from the Windows menu.
2. Type **“regsvr32 C:\HSC7\HSC7.dll”** for registering HSC 6.0 add-in functions.

Alternatively it can be achieved using the following method:

1. Double-click the file **“HSC7.DLL”** in your HSC directory.
2. If the file is *not* registered automatically, which is indicated by an **“Open With”**-dialog box, choose **“Other...”** in the dialog window.
3. Select **“Regsvr32.exe”** from your Windows System directory. Now double-click the file again and it should register automatically.

When unregistering files follow the same procedure, but add the **/u** switch before the file name, i.e. **“regsvr32 /u C:\HSC7\HSC7.DLL”** for unregistering HSC7.dll.

*Description of Regsvr32.exe

To add .ocx and certain .dll files, it will be necessary to run REGSVR32.EXE from the Run option in the Start menu. The following are the commands and switches needed:
regsvr32 [/u] [/s] [n] [i [:cmdline]] dll name or ocx name

/u (unregistered server)

/s (silent; display no message boxes)

/c (console output)

/i Call dll or ocx install passing it an optional [cmdline];

when used with /u calls dll or ocx uninstall

/n Do not call dll RegisterServer; this option must be used with /I