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SOFTWARE NOTICE

Inforex: A data base on experimental studies of phase relations in silicate systems

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Introduction

The Inforex system is a generalized data base for experimental information on mineral-melt equilibria. The program accesses mineral-melt data for over 2200 experiments on natural and multicomponent synthetic silicate systems. The system is designed to be a reference for use in the development of petrogenetic models by providing easy access and a means for manipulating mineral-melt equilibria data.

Experimental data base

The Inforex software is a computerized reference for melting experiments that presents the data in a fixed format with special search words and flags as integral functions of the program. The data base consists of a system of files that refers each entry to information on experimental techniques, conditions, phase assemblages, and the mineral and melt compositions (Fig. 1).

The main experimental data file consists of a sequence of rows corresponding to each experiment. These rows include the reference number, experiment number, magma-type indicator, temperature, pressure, f_{O_2} (or buffer), duration, and type of container. In addition, a number of generalized indicators for glass and crystal experimental products are included in these rows. The system commands are combined with flags indicating the presence of volatile components and the number of bulk chemical compositions in the starting material file (Fig. 2).

Additional information presented include flags of the phase compositions for the experimental products. These are presented in terms of wt% of SiO_2, TiO_2, Al_2O_3, FeO, MnO, MgO, CaO, Na_2O, K_2O, P_2O_5, Cr_2O_3, and H_2O. The Infoman program uses composition flags to search the chemical data files and then presents them on the screen, to be printed or written to a file (Fig. 3). The Inforex database has detailed on-line notes and comments which are easily accessible through the active hot key at any point in the program.

View of experimental data

Reference: Authors. Title.//Source, Year, Vol., Numb., Pages.

Numb 31: Sack R.O., Walker D., Carmichael I.S.E. Experimental petrology of alkalic lavas: constraints on cotectics of multiple saturation in natural basic liquids.//Contrib. Mineral. and Petrol., 1987, V. 96, N 1, P. 1-23.

Experimental conditions and resulted phase assemblages

N	n	SystemN/V	P,kb	Temp	lgfO2	Dur,hr	Con	Phase assemblages					
31	1	ALB- 1 N	0.0	1330	-6.77	10.0	PTL	LQ1	OL1				
	2	ALB- 1 N	0.0	1301	-7.11	10.0	PTL	LQ1	OL1	SP1			
	3	ALB- 1 N	0.0	1234	-7.93	38.5	PTL	LQ1	OL1	SP1			
	4	ALB- 1 N	0.0	1201	-8.37	100.0	PTL	LQ1	OL1	AU1	SP1		
	5	ALB- 1 N	0.0	1176	-8.72	422.0	PTL	LQ	OL	AU	SP		
	6	ALB- 1 N	0.0	1149	-9.09	217.0	PTL	LQ	OL	AU	SP		
	7	ALB- 1 N	0.0	1121	-9.51	312.0	PTL	LQ1	OL1	AU1	SP	LC1	
	8	ALB- 1 N	0.0	1064	-10.41	1460.0	PTL	LQ1	OL1	AU1	SP	SA1	
	9	ALB- 2 N	0.0	1302	-7.10	12.8	PTL	LQ1	OL1	SP			
	10	ALB- 2 N	0.0	1270	-7.48	19.3	PTL	LQ1	OL1	SP			

F1:Help F2:Notes F3:Next F4:Edit F5:Write F9:Quit PgUp/PgDn

Fig. 2. The screen image of the experimental data, experimental conditions, and phase assemblage.

Program description

The Infoman data base manager is coded in C. The data base files are ASCII alphanumeric rows with fixed length. Thus, one can conduct a search or update the files using either the data base manager, or any text editor. The Infoman program is hot-key driven; with function keyboard keys serving as the hot keys. The options available include (1) on-line help with the use of the function keys, (2) presentation of general information on the current state of the Inforex system (see Fig. 1), (3) the ability to update the data base, including addition, exclusion, and modification of files, (4) a scan function to enable the user to browse through the database and conduct a general search of the data requested and then print or save what is of interest as a separate file.

The scan or updating functions are keyed to information regarding experimental conditions (Fig. 2), starting material, and

General System Information

11/15/91 There are 78 entries in the INFOREX data base

2446 runs including	
Natural systems	2148
Synthet systems	298
'NoVol' systems	2255
'Volat' systems	191
1 atm pressure	1039
high pressure	1407
Dur.< 100 hours	1968
Dur.< 100 hours	478

4273 compositions of coexisting phases					
LIQ-	1457	LEUC-	37	FEBS-	1
PLAG-	407	AMPH-	8	____-	0
OLIV-	766	HORN-	19	LLIQ-	0
AUG-	310	PERV-	0	QUEN-	0
PIG-	249	APAT-	0	MNLS-	113
CPX-	0	RUT-	1	MET-	0
OPX-	156	MEL-	16	SULF-	0
ILM-	53	SAN-	1	FLUI-	24
MAGN-	39	BIOT-	13	____-	0
SPIN-	177	QUAR-	2	____-	0
ARM-	5	DIOP-	8	Start-	175
GARN-	30	WHIT-	0	Volat-	191
NEPH-	12	PRPX-	3		

F1:Help F2:Notes F3:Save F4:Print F5:Browse F9:Quit

Fig. 1. The screen image presenting the current state of the Inforex data base.

Edit of experimental data

Reference: Authors. Title.//Source, Year, Vol., Numb., Pages.

Numb 67: Grove T.L., Juster T.C. Experimental investigations of low-Ca pyroxene stability and olivine-pyroxene-liquid equilibria at 1-atm in natural basaltic and andesitic liquids.//Contrib. Mineral. and Petrol., 1989, V. 103, N 3, P. 287-305.

Contents of major components in LIQ - phase, wt.%

Num	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	Cr2O3	H2O
1	56.20	1.27	15.20	8.76	0.19	5.43	7.80	3.42	1.16	0.19	0.05	0.00
2	57.20	1.31	14.50	8.74	0.17	4.87	7.58	3.52	1.34	0.17	0.04	0.00
3	56.90	1.59	13.90	9.15	0.21	4.49	7.53	3.55	1.43	0.22	0.03	0.00
4	57.50	1.61	14.00	8.99	0.21	4.10	7.09	3.62	1.63	0.25	0.05	0.00
5	57.40	1.74	13.80	9.36	0.21	3.99	6.80	3.62	1.69	0.31	0.06	0.00
6	57.70	1.75	13.90	9.41	0.17	3.69	6.79	3.75	1.77	0.23	0.03	0.00
7	57.80	1.87	13.70	9.35	0.20	3.41	6.33	3.82	1.94	0.30	0.04	0.00
8	57.30	1.97	13.60	9.63	0.19	2.99	6.21	3.96	2.23	0.33	0.10	0.00
9	58.00	2.25	13.50	9.22	0.21	2.77	5.91	3.86	2.42	0.29	0.10	0.00
10	59.40	2.32	13.40	9.35	0.17	2.66	5.50	3.74	2.60	0.43	0.00	0.00

F1:Help F2:Notes F3:Next F4:Edit F5:Write F9:Quit PgUp/PgDn

Fig. 3. The screen image of the experimental phase compositions.

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phase compositions (Fig. 3). In the search routine, one can locate data by either author of the source reference or any of the other experimental attributes. Further development of the program will be directed toward the construction of a method of data selection based on the experimental conditions, and other system and phase identifiers.

Hardware requirements

The Infoman program is written for an IBM PC or compatible operating on DOS 3.0 or higher with at least 200 kb RAM available. The data base can be utilized on machines with or without a math coprocessor. A hard disk drive with fast access is more critical to efficient operation. However, it is possible to use a virtual disk. The Inforex system uses color CGA or EGA monitors. Updating the system will be done annually.

Availability

The Inforex data base system, including the manual, will be distributed in the United States through Roger L. Nielsen, College of Oceanography, Oceanography Administration Building 104, Oregon State University, Corvallis, Oregon 97331-5503, U.S.A., (503)737-3023. The Infoman program and the system files are available on either 5.25 in. (two 360 kb or one 1.2 Mb) or 3.5 in. disks for $125.00 made payable to Inforex—R.L. Nielsen. All purchasers will be notified of upgrades and additional programs annually. Further information concerning the Inforex system can be obtained from us or R. Nielsen.

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