UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

QDF DATABASE SYSTEM, VERSION 1.0:

REFLECTANCE OF ORE MINERALS--A SEARCH-AND-MATCH IDENTIFICATION SYSTEM FOR IBM AND COMPATIBLE MICROCOMPUTERS USING THE IMA/COM QUANTITATIVE DATA FILE FOR ORE MINERALS, SECOND ISSUE

by

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A joint report by the British Museum (Natural History) and the
U.S. Geological Survey in cooperation with the International
Mineralogical Association--Commission on Ore Mineralogy

Open-File Report
89-0306A Program Documentation (Paper Copy)
89-0306B Program Documentation Disk
89-0306C Executable QDF Program Disk (serial port plotter)
89-0306D Executable QDF Program Disk (parallel port plotter)
89-0306E QDF Data File Disk

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DISCLAIMER

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INTRODUCTION

Reflectance spectra are measurable, reproducible, and distinctive properties of ore minerals; they provide useful and objective criteria for mineral identification with the microscope, and the measurement technique is easily learned. Reference spectra for 420 minerals have been published in the Quantitative Data File for Ore Minerals (QDF) of the Commission on Ore Microscopy of the International Mineralogical Association (IMA/COM) (Criddle and Stanley, 1986), the most extensive source of quantitative reference data currently available for ore minerals. In addition, computer-assisted microscope-photometers that can measure reflectance in the 400-700-nanometer (nm) range of the spectrum in a few minutes are now available. With these tools, preliminary identification of a mineral is possible in a fraction of the time it would take for analysis with the electron microprobe or other sophisticated techniques.

To further assist geologists in the identification of ore minerals by reflectance measurements, we have designed a computer database system that compares reflectance measurements on unknown minerals with QDF measurements of reflectance in air. Features of the system include a search-and-match routine, reflectance-curve plotting capability, and a user-created database in which to store new reflectance data. Our database system is written in PASCAL and can be run on an IBM PC or PC-compatible computer that has two 5-1/4-inch disk drives and 256K RAM.

The search-and-match routine is based on the indexing scheme of Leonard (1979). When a reflectance value measured for an unknown mineral at 546 nm is entered, this initiates the retrieval of minerals that have reflectances at 546 nm of plus or minus 10 percent of the unknown mineral's reflectance. The listing includes bireflectance at 546 nm, partial dispersion of reflectance for three wavelength pairs (470 and 546 nm, 546 and 589 nm, and 589 and 650 nm), and a reference to the page number of each retrieved mineral in QDF. Users can display the listing on the computer screen or store it in a data file that can be printed.

Database users can obtain additional information from the QDF database for minerals of interest by entering QDF page numbers as search keys. Vickers hardness number (VHN) can be retrieved to complement the search-and-match list; however, a VHN index is not part of our computer program. Color values (trichromatic coefficients, luminance, dominant wavelength, and excitation purity) can also be retrieved for comparison with quantitative color data derived from measurements of the unknown mineral's reflectance. Data measured at 20-nm intervals from 400 to 700 nm can be used to plot reflectance curves; the shapes of these curves are more diagnostic for ore minerals than are the characteristically variable reflectance values. The curves can be displayed on the screen or plotted by a Hewlett-Packard or Hewlett-Packard-compatible plotter. To protect the QDF copyright, the original reflectance values at 20-nm intervals are not displayed or printed.

Reflectance data measured on unknown ore minerals can be entered into a separate database that can be updated as required and that can be used with the search-and-match and curve-plotting routines.
The Quantitative Data File (Criddle and Stanley, 1986), which contains reference spectra for 420 minerals, may be purchased from Publication Sales, British Museum (Natural History), Cromwell Road, London SW7 5BD, England, or from Gower Publishing Company, Old Post Road, Brookfield, Vermont 05036, in the United States.

GETTING STARTED WITH THE QDF DATABASE SYSTEM

HARDWARE

The minimum system needed to run the database program is a computer with two 5-1/4-inch low-density (360K) floppy disk drives and 256K RAM. The program will run on IBM PCs, ATs, PS/2s, and true compatibles running PC-DOS or MS-DOS 2.0 or later. A math coprocessor chip is not required. If you have a printer, you will be able to print files of retrieved data. If you want to plot reflectance curves, you will also need a graphics adapter and pen plotter.

Graphics drivers are included in the program for the following graphics adapters and true compatibles: CGA, MCGA, EGA, VGA, Hercules, AT&T 400 line, and 3270 PC. The graphics adapter is detected automatically by the program.

The program uses Hewlett-Packard Graphics Language instructions to a pen plotter. Scaling set by the program has been tested successfully on a Hewlett-Packard 7550A plotter and a ZETA Sprint plotter. Specifications listed in the HP-GL Programmer's Reference Manual indicate the program will work equally well on the following HP plotters and compatibles: 7475A; 7220A,C,S,T; and 9872A,B,C,S,T. Try the program with other pen plotters, if you have them available, but if the program's coordinate scaling does not fit within the plotter's plotting range, the graph will be truncated at the edge of the plotting range of the plotter you are testing. Future versions of the program will include the capability of using larger plotters with other plotting ranges.

The plotter may be attached to a parallel port on your computer or to an RS-232 serial port designated COM1 with the baud rate (transmission speed in bits per second) set to 300, 600, 1200, or 2400.

PROGRAM AND DATA DISKS

This report includes four release disks:

Disk 1) Program documentation.

Disk 2) QDFSER.EXE, QDFFSER.EXE, and BUILDNDX.EXE. QDFSER.EXE and QDFFSER.EXE are executable programs to run the database on a computer system that has its pen plotter attached to the RS232 serial port. QDFSER.EXE is for use on a computer with a hard disk, and QDFFSER.EXE is for use on a computer with two floppy-disk drives. BUILDNDX.EXE is an executable program that will rebuild the USER database index files if they become corrupted.

Disk 3) QDFPAR.EXE, QDFFPAR.EXE, and BUILDNDX.EXE. QDFPAR.EXE and QDFFPAR.EXE are executable programs to run the database on a computer system that has its pen plotter attached to a parallel port. QDFPAR.EXE is for use on a computer with a hard disk, and QDFFPAR.EXE is for use on a computer with two floppy-disk drives. BUILDNDX.EXE is an executable program that will rebuild the USER database index files if they become corrupted.

Disk 4) QDF.BIN, QDF.IXP, and QDF.IXR. These are the data files of QDF II data. QDF.BIN is the binary file with data for 420 minerals, QDF.IXP is the index file for page numbers, and QDF.IXR is the index file for reflectance at 546 nm.

Use these disks as backup disks only; make a copy of each disk to use as your working disks.

If you are using a computer with two 5-1/4-inch disk drives, format a new disk for the user database files. The program will create the .BIN, .IXP, and .IXR files, comparable to the QDF files, on the new disk.

STARTING THE PROGRAM

If you are using a computer with a hard disk, copy QDFSER.EXE (serial port plotter) or QDFPAR.EXE (parallel port plotter), QDF.BIN. QDF.IXP, and QDF.IXR onto the hard disk. Rename QDFSER.SER or QDFPAR.EXE to QDF.EXE. To run the program, enter "QDF" and a carriage return at the system prompt (for description of programs, see PROGRAM AND DATA DISKS, p. 2).

If you are using a computer with two 5-1/4-inch disk drives, copy QDFFSER.EXE (serial port plotter) or QDFFPAR.EXE (parallel port plotter) to a floppy disk, and rename the program to QDF.EXE on the new disk. This will be your program disk. Put the program disk in drive A and the QDF data disk in drive B. Do not write-protect the disks, or you will not be able to save data files on the program disk and the database will not be opened properly on the data disk. Run the program from drive B by entering "A:QDF" and a carriage return at the B> prompt.

At the beginning of program execution, a welcome message appears on the screen, and the QDF database is automatically opened.

If you are working on a computer with two 5-1/4-inch disk drives, you will be reminded to insert the QDF data disk in drive B. If you put the wrong disk in drive B, the program will try to open empty QDF files on the disk; if there is not enough space on the disk to open empty QDF files, you will get an error message and the program will terminate. If empty QDF files are successfully opened, you will have an empty file and no data to work with.

QDF DATABASE

When the QDF database is opened, a menu listing choices for the QDF DATABASE SYSTEM appears on the screen:

```
Q D F   D A T A B A S E   S Y S T E M
-----------------------------------------------------
```

1) Find mineral by reflectance at 546 nm
2) List QDFII mineral names and page numbers in QDFMIN.LST
3) Plot reflectance curves (find mineral by page number)
4) List VHN and load data (find mineral by page number)
5) List color values (find mineral by page number)

6) USER DATABASE - use your own reflectance data

0) EXIT THE PROGRAM

= = > Use <CTRL BREAK> to exit to DOS from anywhere in the program

Enter the menu number of your choice:

At this point, enter a menu number from 0 through 6, depending on how you want to use the QDF data.

Several of the options (1, 4, and 5) ask if you want data to be saved in a file. If you answer yes, the program will ask you to enter the name of the file in which the data will be saved; the data will appear on the screen whether you answer yes or no. If you answer yes, all data you retrieve during the current cycle of the option will be saved in the same file. The file can be printed from the system prompt when you finish running the program.

If you are working on a computer with two 5-1/4-inch disk drives, enter both the drive and file name for saving the data; e.g., A:filename.dat. Put all your output files on the program disk in drive A; the QDF data disk in drive B is almost full (it has only about 4000 bytes free), and eventually the user database disk will also fill up.

A brief description of each option on the QDF menu follows.

QDF CHOICE 1 - Find mineral by reflectance at 546 nm

The program prompts you to enter the reflectance at 546 nm for which you want to find possible matches. Then the program asks whether the partial dispersion (470 nm to 546 nm) is negative, positive, or zero to low. Finally, the program asks whether the mineral is bireflecting or monoreflecting to weakly bireflecting. After you have entered this information, the program searches the database and prints out a list of minerals that have R546 plus or minus 10 percent of the value you entered and that also meet the other criteria. In some cases, around 50% reflectance, the list of possible minerals can be quite long. Included in the list is the

QDF II page number of each mineral; the page number is the search key for options 3, 4, and 5. You can save the list in a data file.

QDF CHOICE 2 - List QDFII mineral names and page numbers

Use this option if you do not have a copy of the book handy, but you want to run option 3, 4, or 5 for a particular mineral. Minerals in QDF II are listed alphabetically, along with the QDF II page number, in a data file called QDFMIN.LST. You can print QDFMIN.LST from the system prompt.

QDF CHOICE 3 - Plot reflectance curves

To use this option, you must know the QDF II page number of the mineral you want to plot. The program asks whether all curves should be displayed on one graph. If you answer yes, all reflectance curves for the mineral will be plotted on one graph; if you answer no, each curve will be plotted on a separate graph. Reflectance curves are displayed on the screen first, then you are asked if you want to plot the curves on a plotter. Example plots are given in figures 1 and 2.

If you choose plotter plots, the program will calculate the size of the plot and tell you what size paper to load in the plotter (8-1/2x11" (210x297mm) or 11x17" (297x420mm)). The reminder to set dip switches for paper size applies to the ZETA Sprint plotter used to develop the program; there may also be other plotters for which you will appreciate a reminder. Put a narrow black pen in holder 1, wide black pen in holder 2, narrow red pen in holder 3, and narrow blue pen in holder 4 of the plotter's pen carousel.

If your plotter is attached to a serial port, the program will ask you to choose a baud rate (transmission speed in bits per second) of 300, 600, 1200, or 2400; the baud will remain in effect until you exit the program. Communication parameters with COM1 will be set by the program to the baud rate, no parity, 1 stop bit, and 8 bit data. In order to prevent overflow of the plotter buffer, delays have been built into the plotter routine sufficient to avoid problems on most systems that run at 2400 baud. If you get unexplainable plotter output, try running the plotter at a lower baud (exit the program and reset baud on the plotter, then restart the program and choose a lower baud when running this option).

If your plotter is attached to a parallel port, the program will ask for the device name for the parallel port to which the plotter is attached. Example names are LPT1, LPT2, and LPT3.

Next the program asks if you want a grid on the graph. If you answer yes, the plotter will draw a graph with ticks around the perimeter and a grid of lines at 5% reflectance intervals and at 20 nm intervals (see figure 1). If you answer no, your graph will have only the ticks (see figure 2).

Finally, the program asks if you want the page number in the lower right corner. If you answer yes, the QDF II page number or USER record number will be drawn in the lower right corner of the page. This will help you find the mineral of interest if you bind the plots into a notebook along the top edge of the page.

QDF CHOICES 4 and 5 - VHN/load data and color data

To obtain Vickers hardness number (VHN) or color data, you must know the QDF II page number of the mineral for which you want to list data. You can save the data in a file.

QDF CHOICE 6 - USER DATABASE--use your own reflectance data

When you choose QDF option 6, the program closes the QDF database and prompts you to enter the name of your own database (referred to as the USER database throughout this report). You can have more than one database with your own data, just by using different database names. The name should start with a letter of the alphabet, either upper or lower case, and should contain no more than 8 characters. Example database names are "P&J" and "USER".

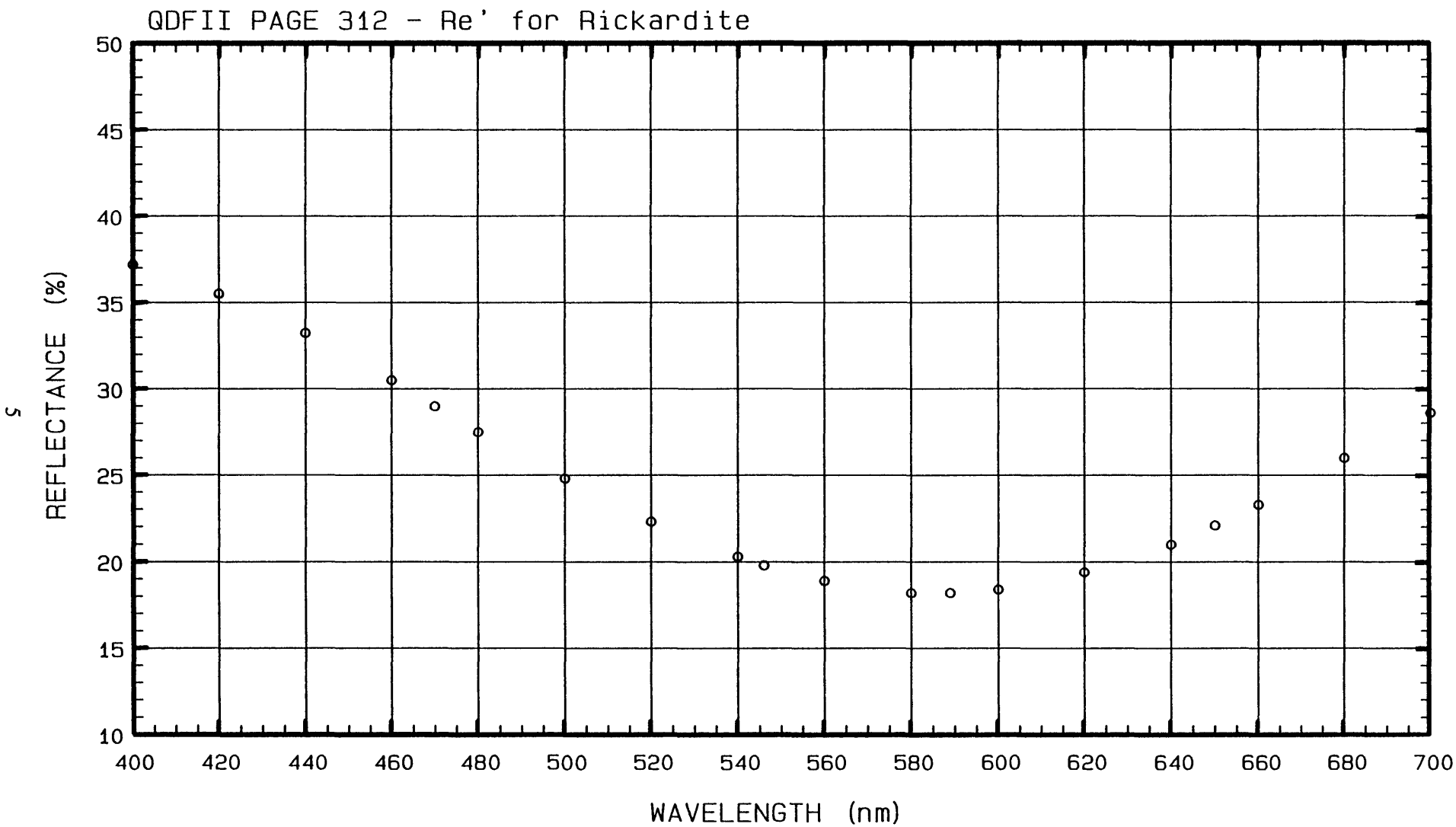

Figure 1. Reflectance curve for Rickardite plotted on a pen plotter by the QDF database program; graph includes ticks and grid.

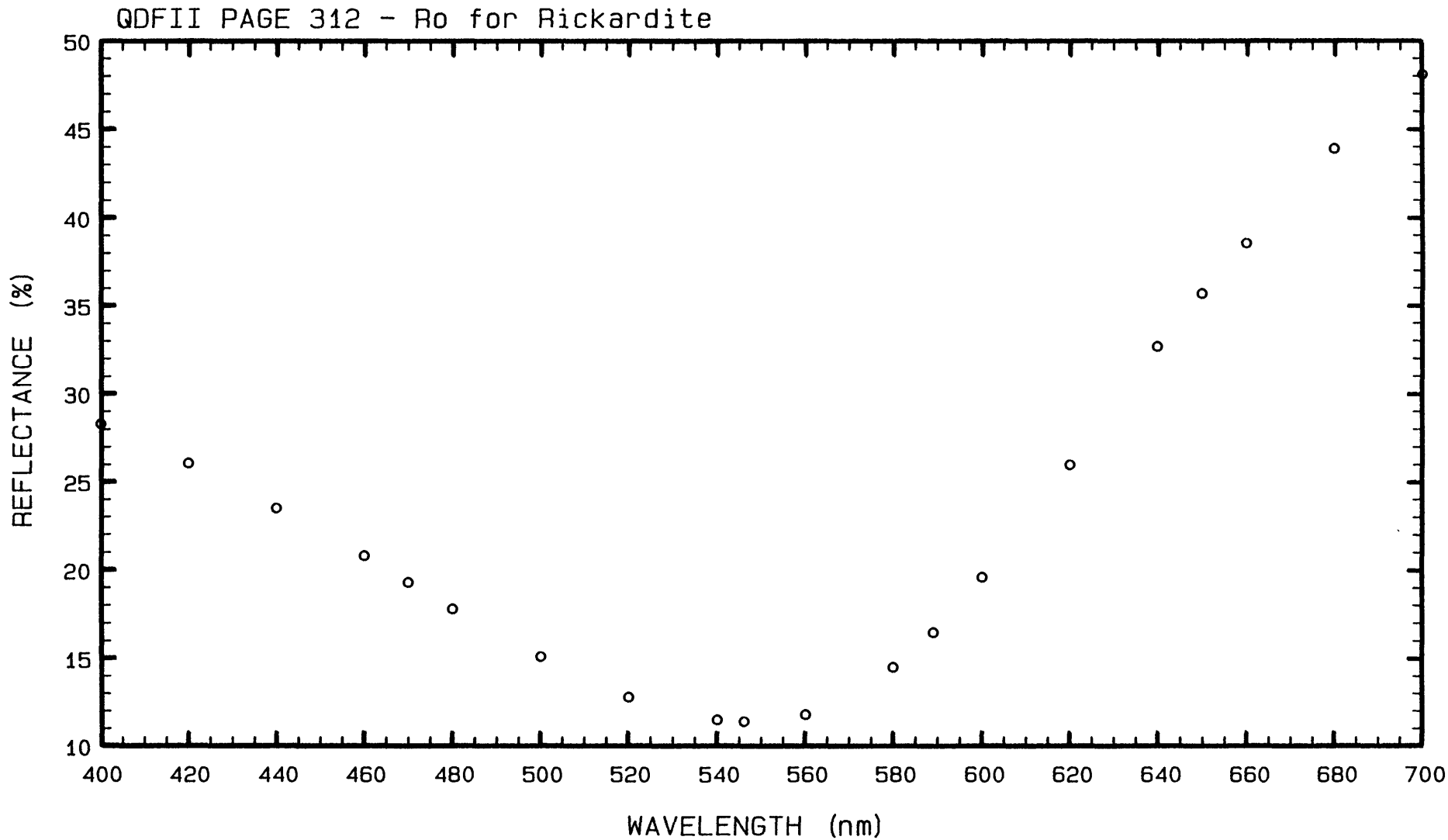

Figure 2. Reflectance curve for Rickardite plotted on a pen plotter by the QDF database program; graph includes ticks but no grid.

After you enter the database name, the program opens your USER database. If you are working on a computer with two 5-1/4-inch disk drives, you will be reminded to change from the QDF data disk to the USER data disk in drive B. The first time you change to the USER database, insert a newly-formatted disk in drive B, and the program will create and open your USER database files. If you do not change disks, you will get an error message and the program will terminate because it will try to open USER files on the QDF data disk although there is not enough space left for them on the disk.

QDF CHOICE 0 - EXIT the program

Before the program terminates, the current database is closed. Remember to print any files in which you may have saved data and delete these files after you have paper copies.

USER DATABASE

When the USER database is opened, a menu listing choices for the USER DATABASE appears on the screen, along with the name of your database:

U S E R D A T A B A S E
---

1) Find mineral by reflectance at 546 nm
2) List mineral names and record numbers
3) Plot reflectance curves (find mineral by record number)
4) List data (find mineral by record number)

5) Add data for a new mineral to the database
6) Interpolate reflectance data
7) Calculate color data from reflectance data
8) Modify data for a mineral in the database

0) RETURN TO THE QDF DATABASE

= = > Use <CTRL BREAK> to exit to DOS from anywhere in the program

Enter the menu number of your choice:

At this point, enter a menu number from 0 through 8, depending on how you want to use the USER database.

Several of the options (1, 2, and 4) ask if you want data to be saved in a file. If you answer yes, the program will ask you to enter the name of the file in which the data will be saved; the data will appear on the screen whether you answer yes or no. If you answer yes, all data you retrieve during the current cycle of the option will be saved in the same file. The file can be printed from the system prompt when you finish running the program.

If you are working on a computer with two 5-1/4-inch disk drives, enter both the drive and file name for saving the data; e.g., A:filename.dat. (Remember to put all output files on drive A.)

Before you enter a lot of data into the USER database, experiment with all the options to see how they work. Give your trial database a name, such as "TEST", that indicates its tentative nature.

A warning about options 5-8: After entering new data, you may occasionally find that if you immediately try to list the data, the program will tell you it cannot find the new mineral (although it is included in the count of minerals in the database). The data have really been stored in the database, but cannot be immediately accessed. Exit the program and start it up again; you should then be able to access the new data.

BACK UP THE USER DATA FILES OFTEN! The data you enter are sure to be safe only if you do so. Although safeguards have been written into the program, database files may be corrupted if there is a power failure while you are using the USER database. If you cannot access the data in your USER database, try to rebuild the index files (see instructions in REBUILDING THE INDEX FILES, p. 10).

A brief description of each option on the USER menu follows.

USER CHOICE 1 - Find mineral by reflectance at 546 nm

This is the same as QDF option 1, except that it operates on the USER database (your own data).

USER CHOICE 2 - List mineral names and record numbers

This option lists the minerals (and record numbers) that you have stored in the USER database. You can save the list in a file.

USER CHOICE 3 - Plot reflectance curves

This is the same as QDF option 3, except that it operates on the USER database (your own data).

USER CHOICE 4 - List data

To use this option, you must know the USER database record number of the mineral for which you want to list data. All of the data you have entered, as well as data calculated by the program and stored in the database (USER options 5-8), are displayed on screen and, if you choose, in a file. If you subsequently change the data stored for any mineral, you will probably want to list the data again after the change has been made. If you list several minerals during one cycle of this option, you will find that file output is arranged one mineral to a page, with a wide left margin to allow for punched holes and insertion into a notebook.

USER CHOICE 5 - Add data for a new mineral to the database

This is the option to use when you are adding a new mineral to the database. The program automatically calculates the record number for the new mineral and displays it on the screen. You are then prompted to enter information for the database:

Mineral name: (31 characters maximum)
Chemical formula: (74 characters maximum)
VHN (line 1): (36 characters maximum)
VHN (line 2): (36 characters maximum)
VHN (line 3): (36 characters maximum)
Load: (number)
Number of reflectance curves: (number--1, 2, or 3)

For each curve for the mineral--
Curve label: (3 characters maximum--R or R'; Ro, Re, or Re';
R1 or R2; Ra, Rb, or Rc)
Reflectance data for COM standard wavelengths (number)
Reflectance data for 20-nm intervals from 400-700 nm (number)

If you just press the carriage return (without entering data) for any of the data fields except number of reflectance curves or curve label, blanks will be stored for character fields and zeros for numeric fields. The program forces you to enter the number of reflectance curves. If you do not enter a curve label, "R?" will be stored in the database by default.

Do not attempt to add more than 999 minerals to any user database; the database will only allow record numbers less than 1000. If you add more than 420 minerals to your user database, the files will become too large to fit onto one 5-1/4-inch 360K floppy disk.

USER CHOICE 6 - Interpolate reflectance data

To use this option, you must know the USER database record number of the mineral for which you want to interpolate data. You must also, of course, have entered some reflectance data from which the rest of the data can be interpolated or extrapolated. Remember, if you do not enter reflectance data for a COM standard wavelength or for any of the 20-nm intervals from 400 to 700 nm, the program stores a zero in the database. This option replaces the zero reflectance values (the ones you did not enter) with interpolated or extrapolated reflectance values. Remember, too, that this option operates on all curves for the mineral you select. If you have specified that the mineral has more than one curve, you must have entered enough reflectance data for each curve from which the rest of the data for that curve can be interpolated or extrapolated, or this option will not operate correctly and may corrupt your data file.

The order of calculation is as follows:

1) The program checks to see if data for the 4 COM wavelengths are the only reflectance data that have been entered; if so, reflectances at 20-nm intervals from 400 to 700 nm are extrapolated and interpolated from the 4 COM wavelengths.

2) If the reflectance values at the 4 COM wavelengths have not all been entered, or if reflectance values at some (but not all) of the 20-nm intervals have been entered, the following calculations are performed:

    a) First, if reflectance values are missing for 20-nm intervals between 20-nm wavelengths for which reflectance has been entered, the program interpolates between the known 20-nm reflectance values.

    b) Second, if reflectance values are missing at the blue end of the spectrum, the program extrapolates from 20-nm wavelengths for which reflectance has been entered or calculated in 2a above.

    c) Third, if reflectance values are missing at the red end of the spectrum, the program extrapolates from 20-nm wavelengths for which reflectance has been entered or calculated in 2a above.

3) If reflectance values are missing for any of the 4 COM wavelengths, the program interpolates reflectance at the missing wavelength from the reflectance values at 20-nm intervals entered by you or calculated in 2a, 2b, and 2c above.

Interpolation or extrapolation is hazardous. The constructed reflectance curve may depart significantly from the true curve, and color values derived from the interpolated or extrapolated reflectance data should be viewed with caution.

USER CHOICE 7 - Calculate color data

To use this option, you must know the USER database record number of the mineral for which you want to calculate color data. The program calculates color data, referred to Commission Internationale d'Eclairage (CIE) standard illuminant C, according to the weighted ordinates recalculated by Atkin and Harvey (1979). Trichromatic coefficients for the spectrum locus and standard illuminant C used in the calculation are from Hardy (1936). When you run this option, color data are automatically calculated and stored in the datafile for your mineral. If you modify any of the reflectance data later by entering newly-measured values, you should recalculate the color data by running this option again.

If the excitation purity (P_e) of a mineral is 2 percent or less, the dominant wavelength is virtually meaningless, owing to the near-coincidence of the trichromatic coefficients of the mineral and the standard illuminant. Accordingly, you may find that the dominant wavelength of your mineral differs appreciably from

that of a reference mineral in QDF II. At P_e less than or equal to 2 percent, the eye can seldom distinguish or describe an intrinsic tint for a mineral. This observational fact reinforces the lack of meaning for the dominant wavelength of minerals having very low excitation purity.

USER CHOICE 8 - Modify data for a mineral in the database

To use this option, you must know the USER database record number of the mineral for which you want to modify data. You may first want to list and print the data for the mineral (USER option 4) and note on your paper copy the changes to be made. When you enter the mineral number, the mineral name and record number are displayed at the top of the screen, and a MODIFY menu appears:

WHAT DO YOU WANT TO CHANGE FOR THIS MINERAL?
1) Mineral name
2) Chemical formula
3) VHN
4) Load
5) Number of reflectance curves
6) Reflectance curve label
7) Reflectance data for COM standard wavelengths
8) Reflectance data for 20-nm intervals from 400 to 700 nm
0) NO MORE CHANGES

Try out the MODIFY menu to see what it can do. Remember, if you just hit the carriage return (without entering data) for any of the data fields except number of reflectance curves, the original value will be erased and zero or blanks will be entered (the program forces you to enter the number of reflectance curves, however). You can always go back to the USER menu and list the data (USER option 4) at any time. MODIFY menu option 0 takes you back to the USER menu. Until you execute option 0, the modified data are only in the computer memory; they are written to disk when you choose option 0.

USER CHOICE 0 - RETURN TO THE QDF DATABASE

When you return to the QDF menu you can EXIT the program (QDF menu option 0), work with the QDF database (QDF options 1-5), or open a user database (QDF option 6). If you choose QDF option 1 through 5, the program will close the USER database and open the QDF database.

If you are working on a computer with two 5-1/4-inch disk drives, you will be reminded to insert the QDF data disk in drive B. If you have the wrong disk in drive B, the program will try to open empty QDF files on the disk; if there is not enough space on the disk to open empty QDF files, you will get an error message and the program will bomb. If empty files are successfully opened, you will have no data to work with.

You must return to the QDF database (USER option 0) and choose QDF option 6 (USER DATABASE) if you want to open another database of your own data.

REBUILDING THE INDEX FILES

Occasionally an index file (an .IXP or .IXR file) may be corrupted or lost due to a power failure or computer malfunction, but the data file (the .BIN file) remains intact. If this happens you can rebuild the index files for your USER database. If the QDF database files are damaged, just recopy them from the backup disk (Disk 4).

If you are using a computer with a hard disk, copy BUILDNDX.EXE onto the hard disk. To run the program, enter "BUILDNDX" and a carriage return at the system prompt.

If you are using a computer with two 5-1/4-inch disk drives, copy BUILDNDX.EXE to your program disk. Put the program disk in drive A and put your USER data disk in drive B. Run the program from drive B by entering "A:BUILDNDX" and a carriage return at the B> prompt.

The program will ask you which database you are rebuilding index files for. Enter the name of the database (8 characters maximum) and a carriage return, and the program will rebuild the files by writing over the old ones.

ADDITIONAL SUGGESTIONS

The menus tell you to use <CTRL BREAK> to get out of the program--hold the CTRL key and the BREAK key down at the same time. This works everywhere except during curve plotting. If the program hangs up for some reason and <CTRL BREAK> does not terminate the program, you must reboot the system to get out.

If you mistakenly enter an option that requires the page number or record number as the search key, use number 0 to get out--the program will tell you it cannot find a record for number 0 and ask if you want to try again. Just say no.

FAILURE TO IDENTIFY YOUR MINERAL

You may fail to identify your mineral for various reasons. Some common reasons are:

1) Compositional variation, which occurs in many ore minerals.

2) Incompleteness or inaccuracy of your own reflectance measurements.

3) Incompleteness of the QDF II database. Extensive though it is, the database does not include all the known ore minerals. You may create other databases, as USER files, from sources such as Chen and others (1979), Chvileva and others (1977), Henry (1977), Picot and Johan (1982), Vyal'sov (1973), the journal literature, and your own files.

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NOTE FOR THE MONTHLY LIST

QDF DATABASE SYSTEM, VERSION 1.0: REFLECTANCE OF ORE MINERALS--A SEARCH-AND-MATCH IDENTIFICATION SYSTEM FOR IBM AND COMPATIBLE MICROCOMPUTERS USING THE IMA/COM QUANTITATIVE DATA FILE FOR ORE MINERALS, SECOND ISSUE

by Carol N. Gerlitz, B.F. Leonard, and A.J. Criddle

To assist geologists in the identification of ore minerals by reflectance measurements, a computer database system has been designed that compares reflectance measurements in air on unknown minerals with similar measurements on the 420 known minerals included in the Quantitative Data File for Ore Minerals, Second Issue, of the Commission on Ore Mineralogy of the International Mineralogical Association (IMA/COM). Features of the system include a search-and-match routine, reflectance-curve plotting capability, and a user-created database in which to store new reflectance data. The system can be run on an IBM PC or PC-compatible computer that has two 5-1/4-inch low-density (360K) floppy disk drives, 256K RAM, and PC-DOS/MS-DOS 2.0 or later. A math coprocessor chip is not required. The program's reflectance-curve-plotting option requires a graphics board and HP GL series pen plotter. Graphics adapters supported by the program include CGA, MCGA, EGA, VGA, Hercules, AT&T 400 line, and 3270 PC. OF 89-0306A, Documentation, 12 p., paper copy or microfiche; OF 89-0306B, Program documentation diskette; OF 89-0306C, Executable QDF program diskette (serial port plotter); OF 89-0306D, Executable QDF program diskette (parallel port plotter); OF 89-0306E, QDF data file diskette. All diskettes are 5-1/4-inch 360K disks.