

Galactic Industries Corp.

*Software Products for
Analytical Spectroscopy*



Galactic Industries History

1985: Galactic is founded on the concept that software designed for inexpensive PCs could provide analytical scientists with the speed, flexibility and data processing power of traditional instrument workstations. The concept is to free the instrument to do what it is there for: collecting data.



Galactic Industries Product Milestones

- *1986: DOS-based Spectral Display & Processing Software - Spectra Calc*
- *1987: Spectral Library Search & first Instrument Control versions of Spectra Calc*
- *1989: Enhancements for Chromatography & Hyphenated techniques - Lab Calc*
- *1992: Windows-based software - GRAMS/386*
- *1994: Real time 3D visualization - GRAMS/3D*
- *1996: Spectral Notebase - GRAMS/32*
- *1997: Full 32-bit software with Network Administration - GRAMS/32 Version 5*



Analytical Laboratories Today...

- *Too many different instruments and software packages*
- *Still have instrument “down time” while data is processed on workstation*
- *No common data file formats or central storage of raw data*
- *LIMS good for storing results; limited for raw data*

Corporate Software Standardization

- *Unified desktop interface for all raw instrument data*
- *Common data file format*
- *Provide basic functionality for analytical techniques*
- *Network installation, administration & user access control*
- *Database interfaces for archive & retrieval of raw data*

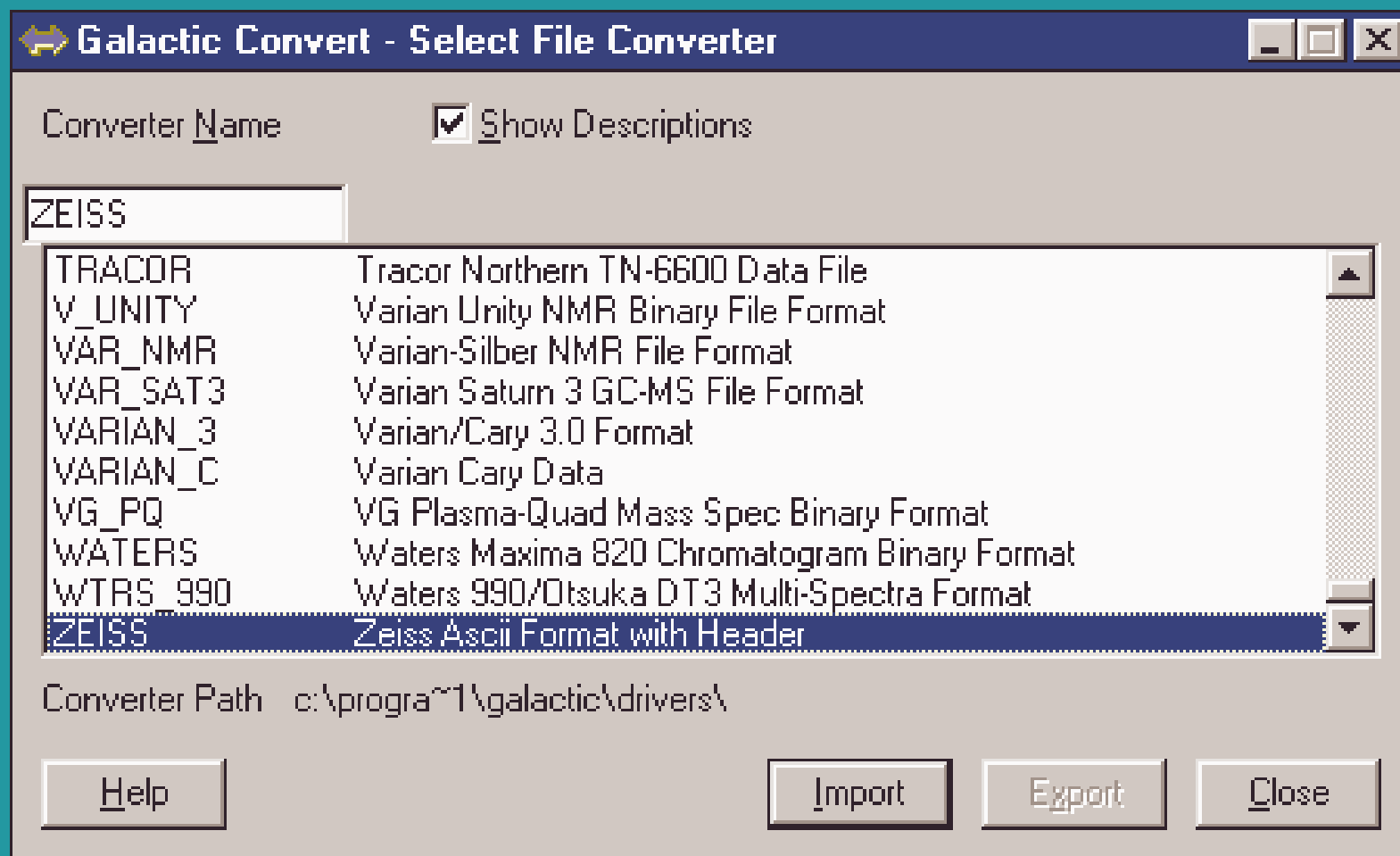


GRAMS/32[®] with Spectral Notebase

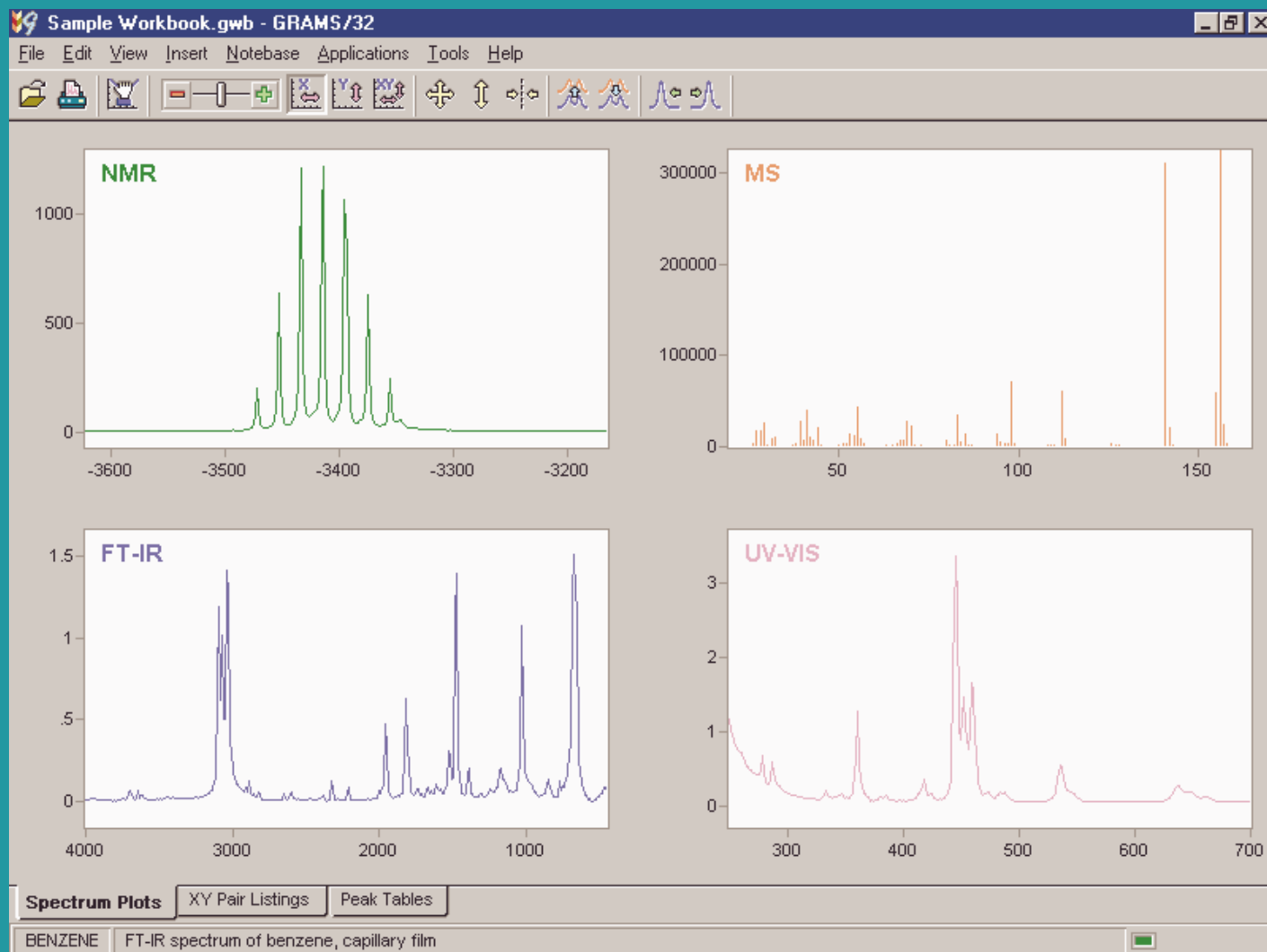
- *Import or collect data from hundreds of instruments into common file format*
- *Fast, powerful data visualization and presentation quality graphics*
- *Comprehensive data processing library for multiple instrument techniques*
- *Data security and user administration*
- *Advanced database data management*



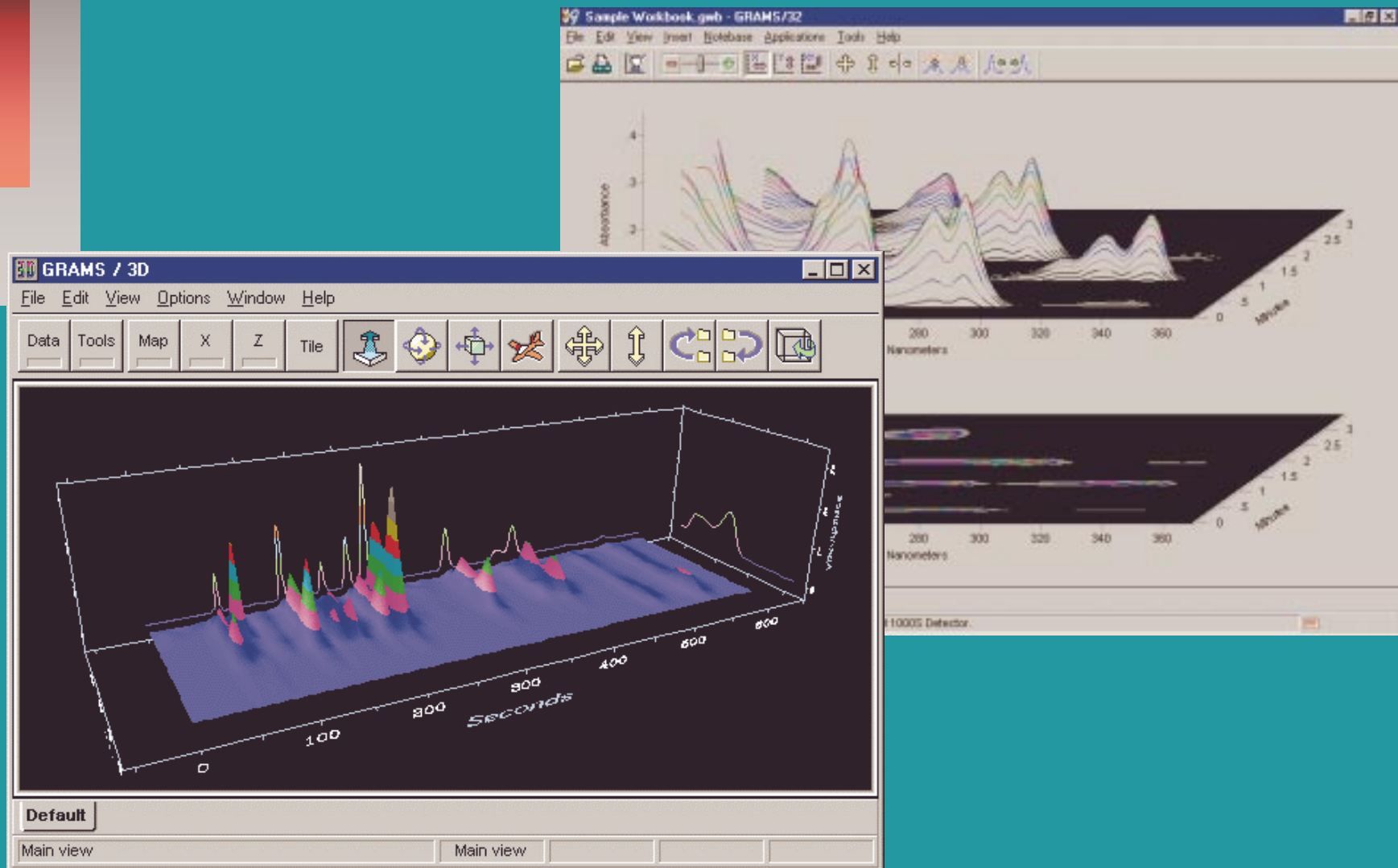
GRAMS/32: Data File Import



GRAMS/32: *Spectra from Different Techniques*



GRAMS/32 & GRAMS/3D: Multi-dimensional Data Visualization



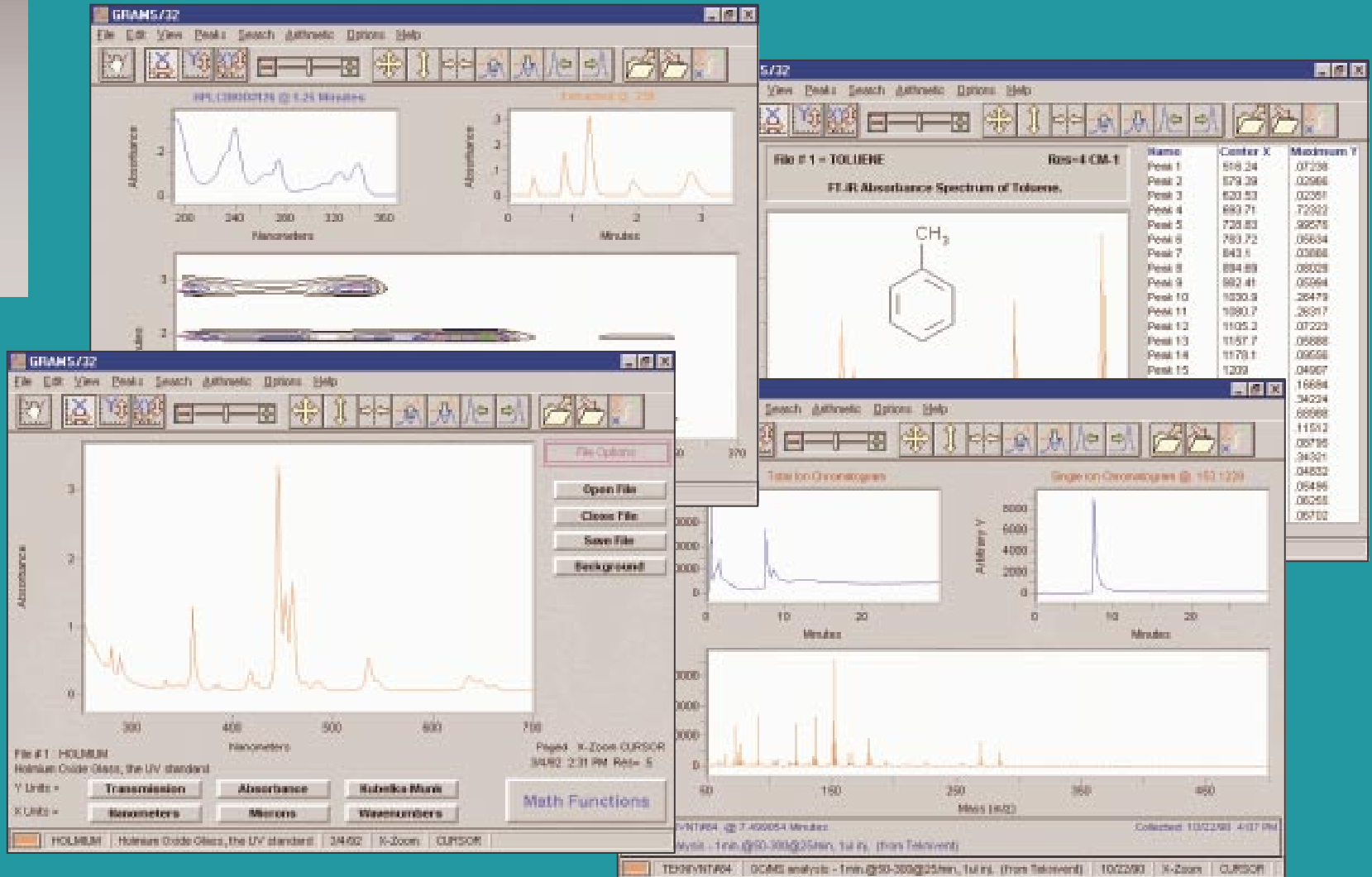
GRAMS/32:

Data Visualization & Graphics

- *Real time zoom and scroll*
- *Multiple data windows: single, overlay, stack*
- *2D and 3D data displays*
- *Add annotations, peak marks, tables, graphics, and more*
- *Paste other OLE objects like chemical structures, equations, etc.*



GRAMS/32: Create Custom "View Pages"



GRAMS/32:

Comprehensive Data Processing

- *General data processing routines*
- *Instrument technique-specific applications*
- *Chemometrics and specialized data processing*
- *Utilities & Macro Wizard*
- *Powerful Array Basic™ language*



GRAMS/32: General Data Processing

The screenshot displays the GRAMS/32 software interface with three main windows:

- Derivative Functions (Top Right):** Shows settings for a Sav-Golay convolution function. The Derivative is set to 1st, Degree to 2, and Points to 5. It includes buttons for Apply, Autoscale, Auto Y, OK, Cancel, and Help. The sample file is HOLMIUM.
- Baseline Options (Middle Right):** Shows settings for baseline processing. Under Fixed Points, Multi-Point is selected. Force Points onto Data is set to Yes. Leveling Mode is Level Only. It includes buttons for Autoscale, Auto Y, Apply, Undo, OK, Cancel, and Help. The sample file is CARY2.
- Result (Top Center):** A plot showing the derivative of the data, with a y-axis ranging from -0.2 to 0.6 and an x-axis from 450 to 650.
- Result (Bottom Left):** A plot showing the original data with a baseline fit. The y-axis ranges from 0 to 2.4 and the x-axis from 260 to 320. A legend at the bottom indicates 'BASELINE'.

At the bottom of the interface, a legend for the Baseline window states: "Right click in BOTTOM trace box to add points. Left click to move points. Left double click to delete a point."

GRAMS/32: IR Spectral Library Searching

Spectral ID
File Edit View Search Tools Help

Spectrum Search
Peak Search
Text Search
Cascade Search
New Search
Options...

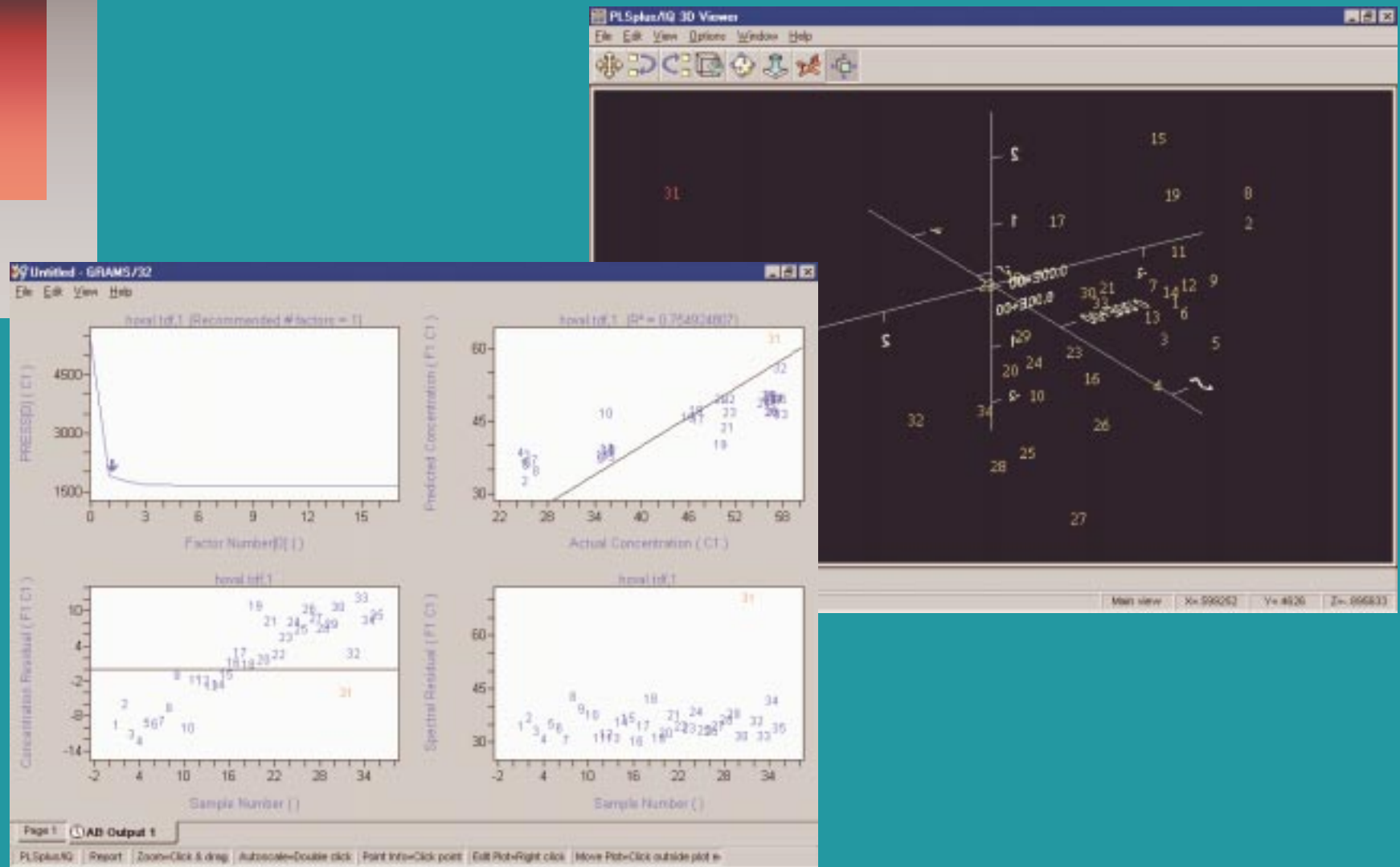
1051.55

3500 3000 2500 2000 1500 1051.55

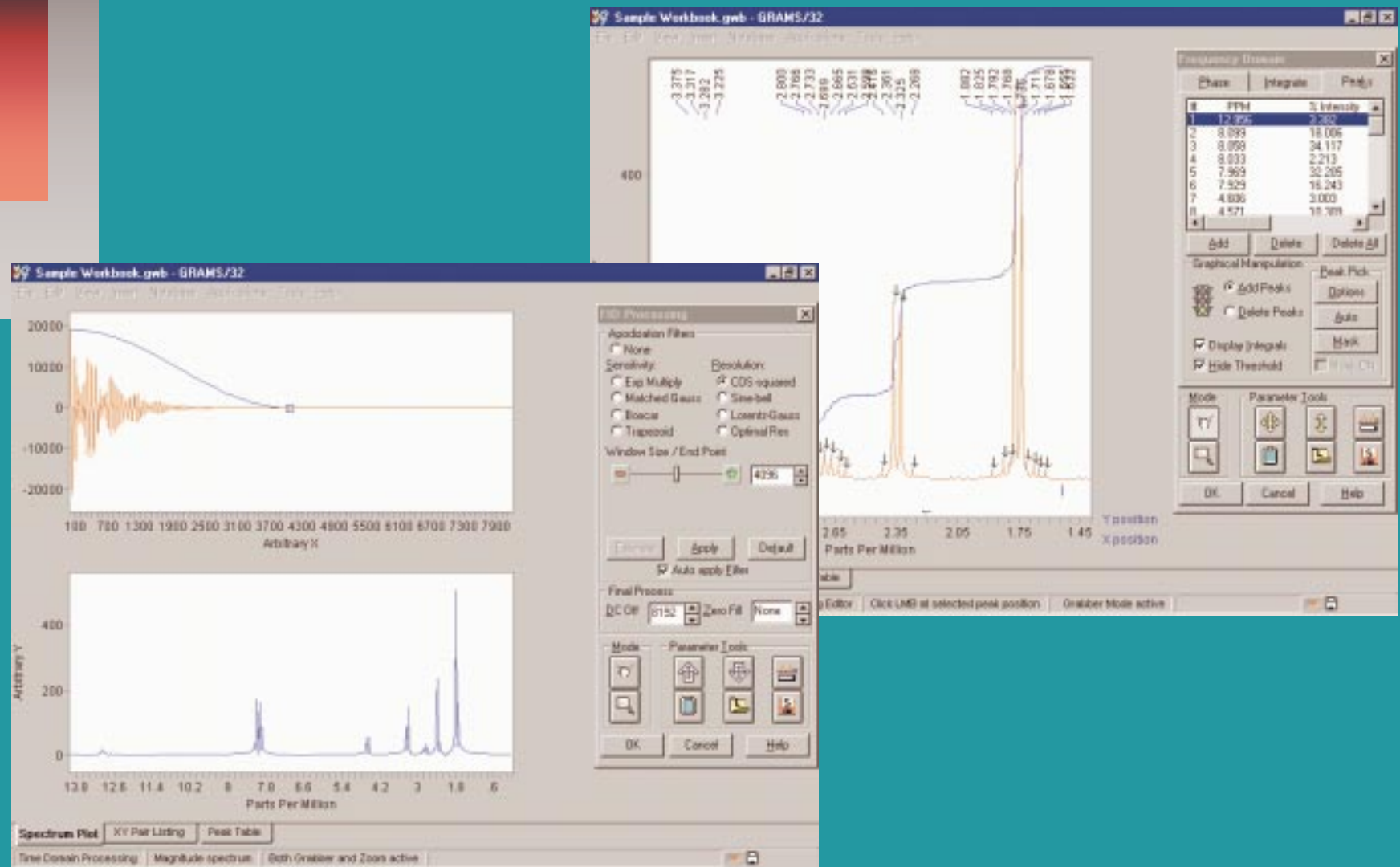
BENZENE, 99+%, A.C.S.
SPECTROPHOTOMETRIC
GRADE
Aldrich Catalog #: 15462-8
Aldrich Vapor FT-IR vol. 3, 849A
Aldrich FT-IR vol. 1, 931A
Sigma-Aldrich Safety Library vol. 1, 349A
FP=+12
RI=+1.5010
RTECS#=CY1400000
Density=0.874
MF=C6H6
CAS=71-43-2
MP=+5.5
BP=+80.2
MW=78.11
Copyright Aldrich Chemical Co., Inc.

Hit	Quality	Memo	Library(Index)
1	0.2729293	Benzene, 99+% CAS#=71-43-2	E:\LIBS\ALDCON1.lib(#428)
2	0.2838724	Benzene	E:\LIBS\EPAVAP.lib(#557)
3	0.2922743	BENZENE, 99+%, A.C.S. SPECTROPHOTOMETR	E:\LIBS\ALDRICH.lib(#2501)
4	0.3774729	BENZENE	E:\LIBS\SADTLER\TU.lib(#6)
5	0.5030103	"Benzene, cyclopropyl-"	E:\LIBS\EPAVAP.lib(#3238)
6	0.5247026	CYCLOPROPYLBENZENE, 97%	E:\LIBS\ALDRICH.lib(#2519)
7	0.5344661	"Benzene, (1-chloroethyl)-"	E:\LIBS\EPAVAP.lib(#146)
8	0.5371754	Benzyl mercaptan	E:\LIBS\EPAVAP.lib(#1873)
9	0.5579877	BENZYL MERCAPTAN, 99%	E:\LIBS\ALDRICH.lib(#3353)
10	0.5597314	"Sulfide, benzyl phenyl"	E:\LIBS\EPAVAP.lib(#2319)
11	0.5793452	BROMODIPHENYLMETHANE, 97%	E:\LIBS\ALDRICH.lib(#2889)

GRAMS/32: PLS Calibration Development



GRAMS/32: "1-D" NMR Data Processing



GRAMS/32:

Data Security and Administration

- *Automated data processing audit trail*
- *User passwords and access privileges*
- *Electronic signatures*
- *Galactic “Certified” data processing applications*
- *Encrypt custom algorithms and processing routines*



GRAMS/32:

Spectral Notebase™ Database

- *Archive, organize, search and retrieve instrument data*
- *Built-in MS Access database engine*
- *ODBC connectivity for commercial relational databases*
- *Easy-to-use Wizards for creating databases and queries*




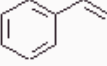















GRAMS/32: Spectral Notebase Browsing

Sample Workbook.gwb - GRAMS/32

File Edit View Insert Notebase Applications Tools Help

File # 1 = C:\GRAMS5\DATA\SAMPLE1.ODB 1.30E+01 Rows

Source	Spectrum	Text File	Document File	Image Document
PROJ1-445		NMR; CDCL3, 5TH SET GE/Nicolet Charm Created: 3/4/92 4:46 PM	Document	
PROJ1-446		RES 4 POLYSTYRENE Created: 2/4/93 10:07 AM PROJ1-446		
PROJ1-349		barbiturates sample Created: 9/18/89 5:37 PM PROJ1-349	$\sum_0 \sqrt{A \times B^2}$	
PROJ1-347		Gasoline sample at 30 Hz Created: 7/28/89 2:20 PM PROJ1-347	Worksheet	
PROJ1-397		Polystyrene spectrum from NIRSystems instrument Created: 8/1/89 2:39 PM	Slide	
PROJ1-397		Princeton Instruments ST-1000 Diode Array PROJ1-397	Wave Sound	
PROJ1-364		8450', DF=2, Giesenschlag drilled cuttings Created: 6/12/91 3:36 PM		
PROJ1-363		Raman Spectrum from SPEX SpectraMax Software Created: 8/1/94 4:16 PM	Document	
PROJ1-361		Varian Cary3 - Coated mirror Created: 9/12/91 5:00 PM	Bitmap Image	

Query_1 Sample1 Spectrum Plot XY Pair Listing Peak Table

[POLYSTY] Polystyrene spectrum from NIRSystems instrument

GRAMS/32: Spectral Notebase Editing

Document in C:\GRAMS\DATA\sample1...

File Edit View Insert Format Tools Table
Window Help

Coupling Quantitative and Qualitative Chemom...

Quantitative chemometric methods such as PL determining the compositional makeup of mate materials based solely on subjective requireme chemometrics it is important to recognize which Quantitative and Qualitative chemometrics are techniques to improve the ability to detect outli best model. In this paper we will give a number

1. W. Lindberg, J. Persson and S. Wold, Anal.
2. D. Haaland and F.V. Thomas, Anal. Chem.

Page 1 Sec 1 1/1 At 0" Ln

File #	Source	Spectrum	Notes
PROJ1			
PROJ1			
PROJ1			
PROJ1			
PROJ1			
PROJ1			
PROJ1			
PROJ1	PROJ1-397		Created: 7/28/89 Polystyrene spectrum from NIRSystems
PROJ1	PROJ1-397		Princeton Instruments ST-1000 Diode

ISIS/Draw - [C:...

File Edit Options Object
Style Templates Chem
Window Help

Molecule Sketch

Wave

[GESPC1] CDCL3, 5TH SET GE/Nicolet Charm 3/4/92 X-Zoom CURSOR

GRAMS/32 Software

- *Provides a common environment for gathering, viewing, and processing data from many different sources*
- *Spectral Notebase organizes and archives all laboratory data in industry standard databases*