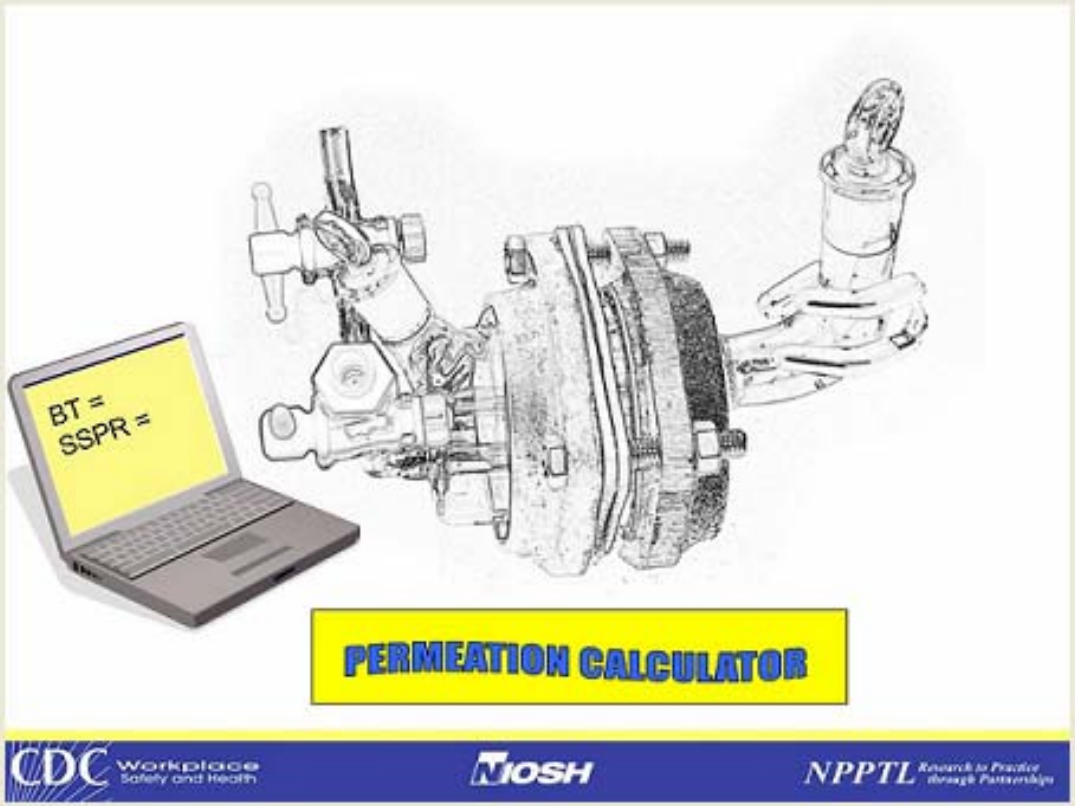
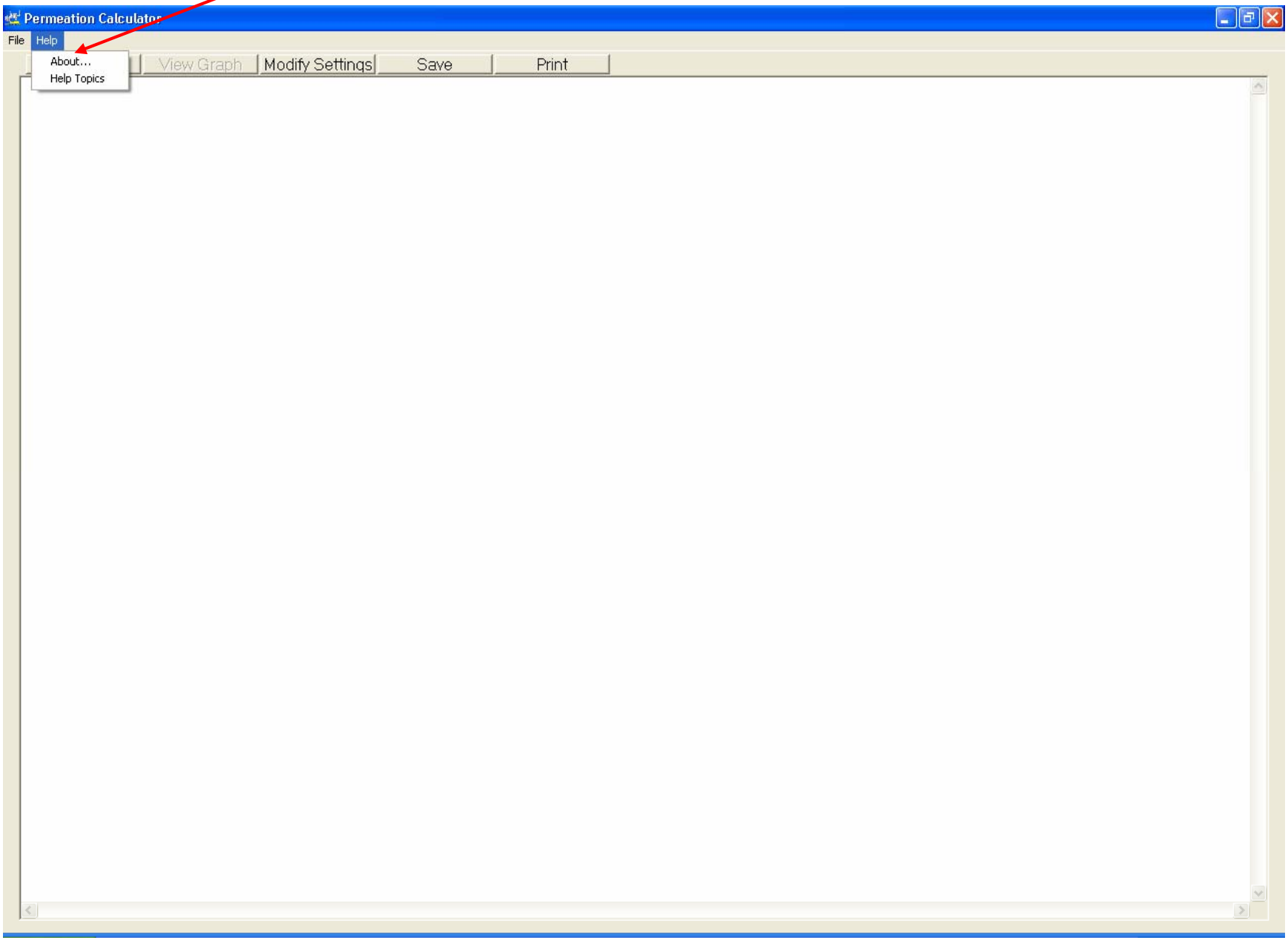
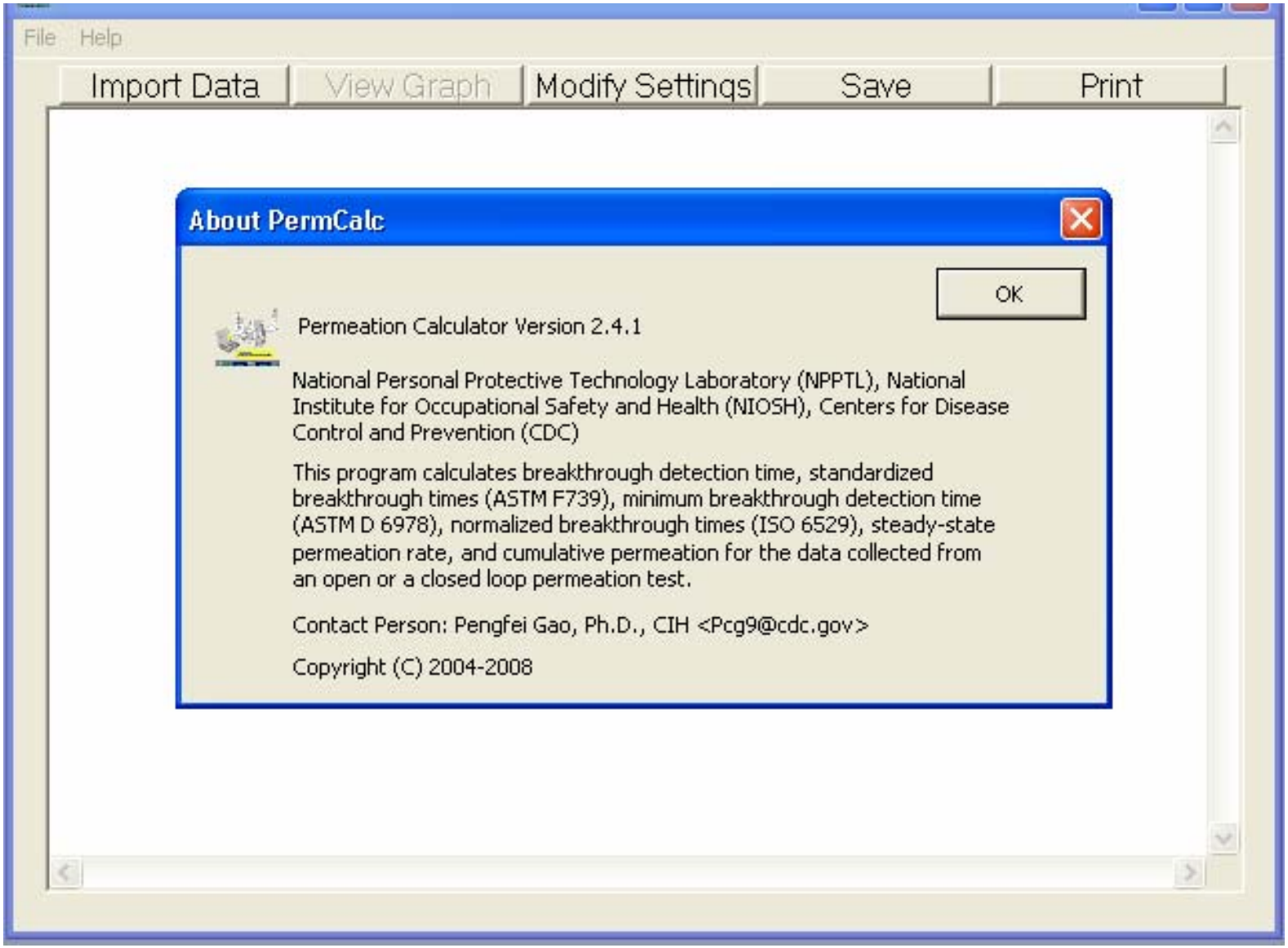
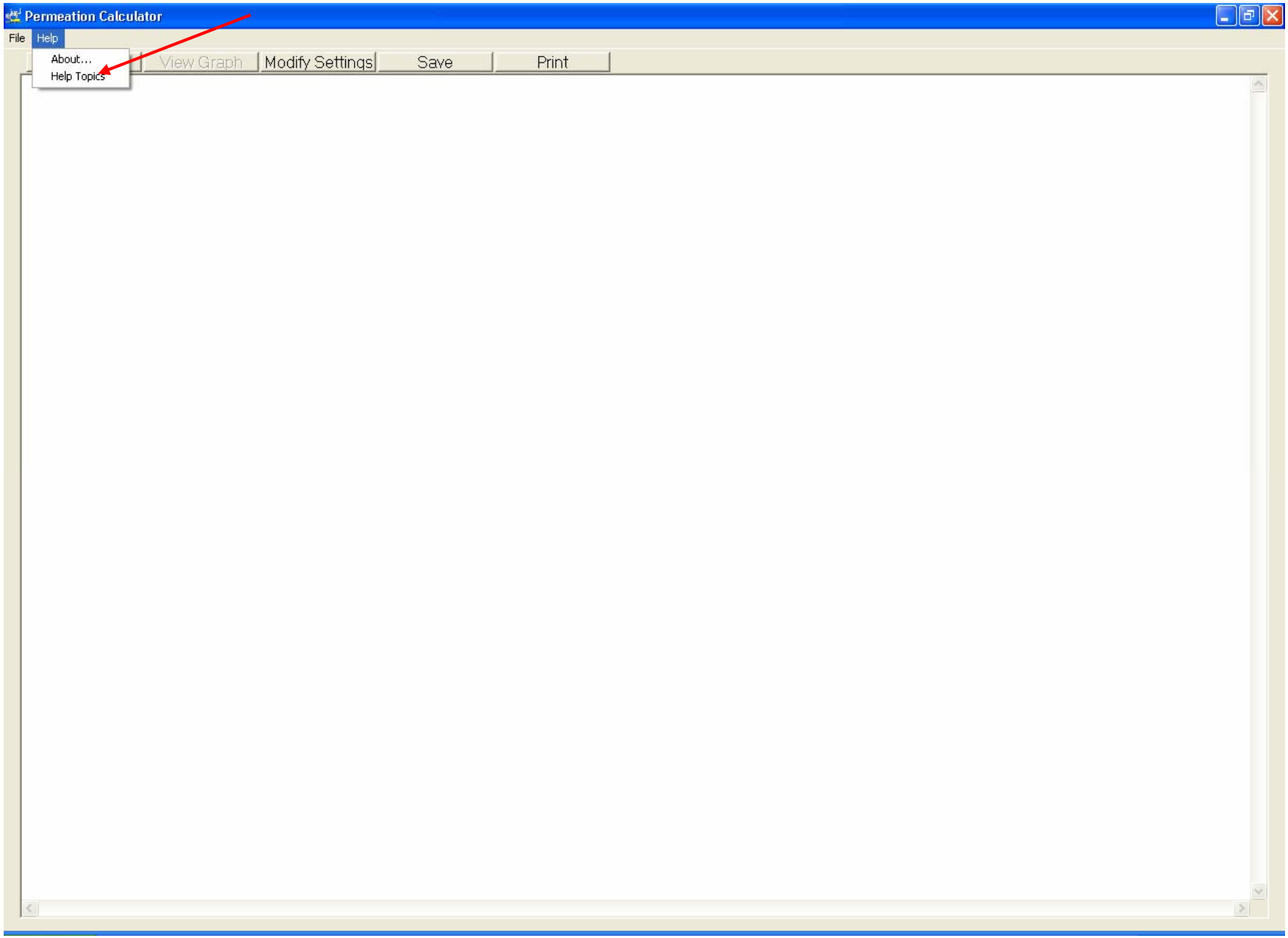
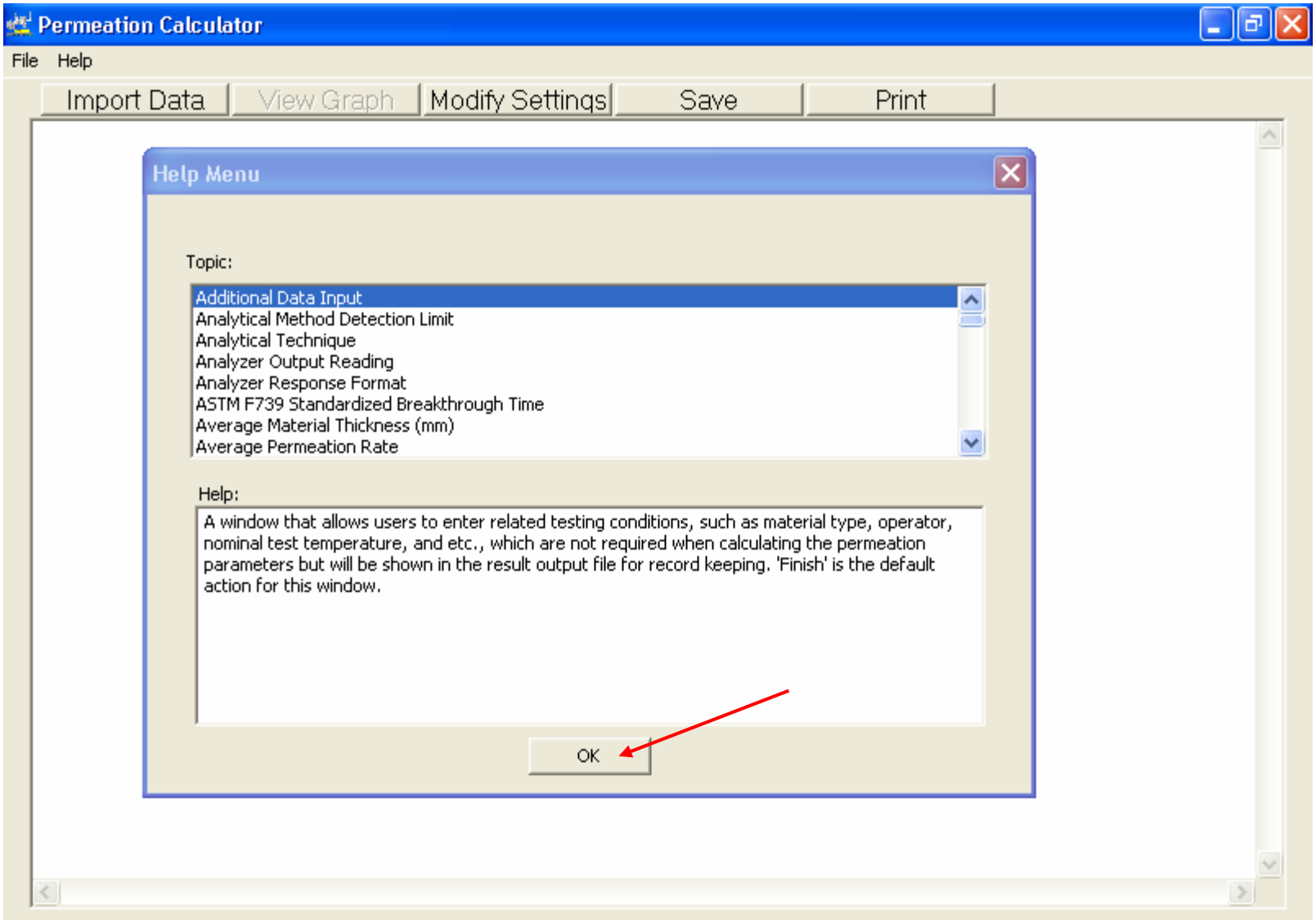
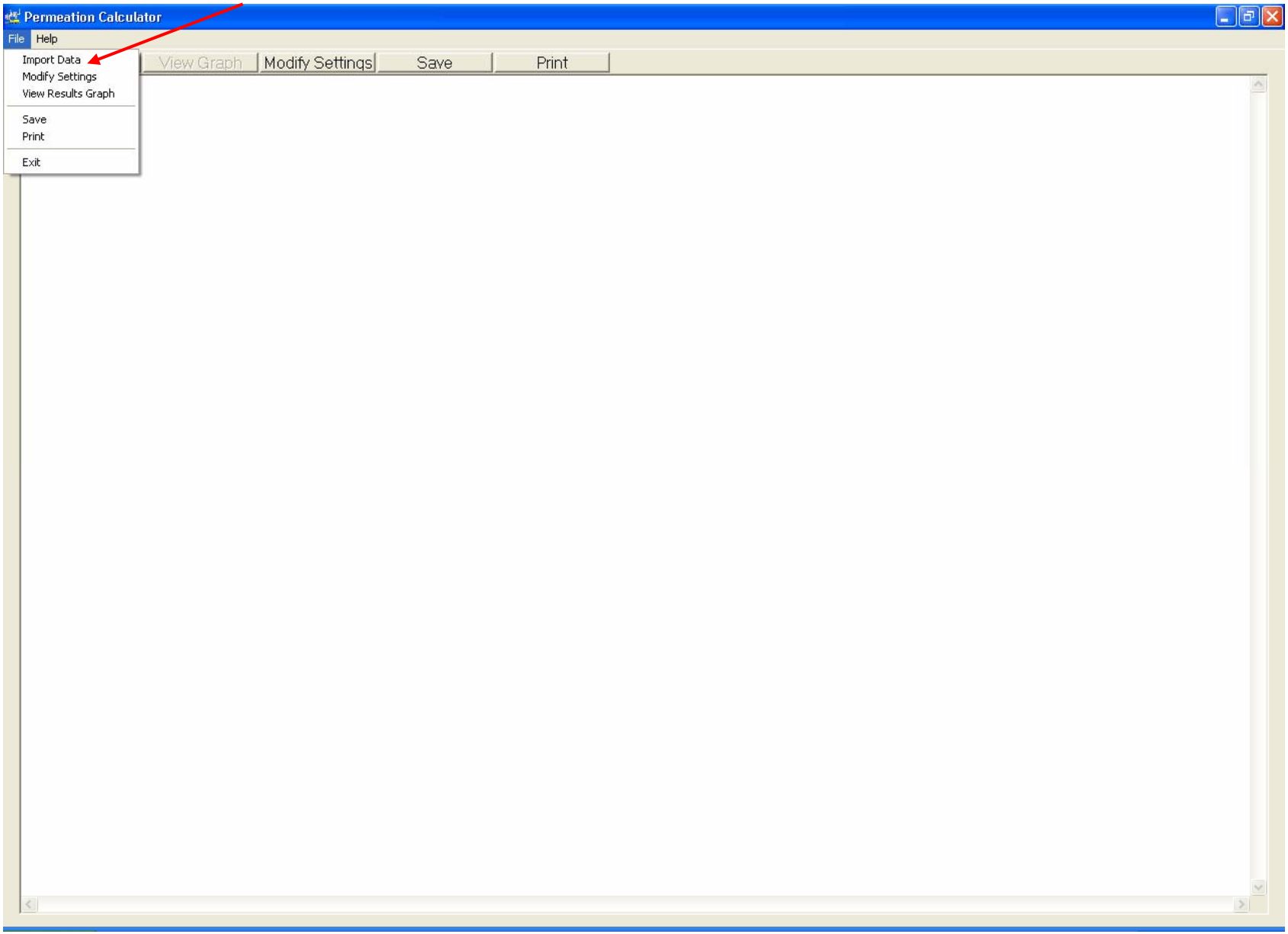

BT =
SSPR =
PERMEATION CALCULATOR
CDC Workplace Safety and Health
NIOSH
NPPTL
Click Here
Permeation Calculator Version 2.4.1

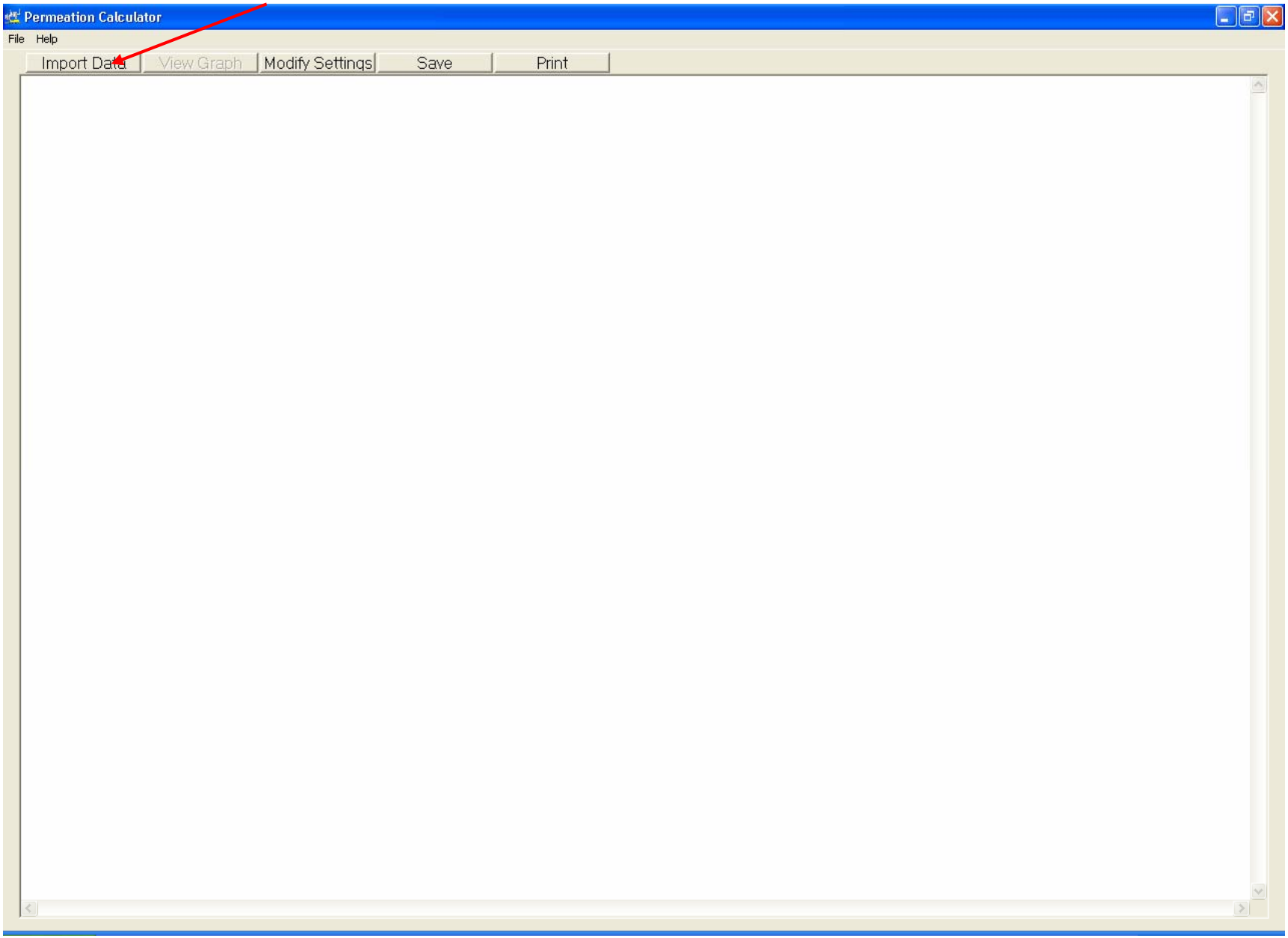

Permeation Calculator
File
Help
About...
Help Topics
View Graph
Modify Settings
Save
Print

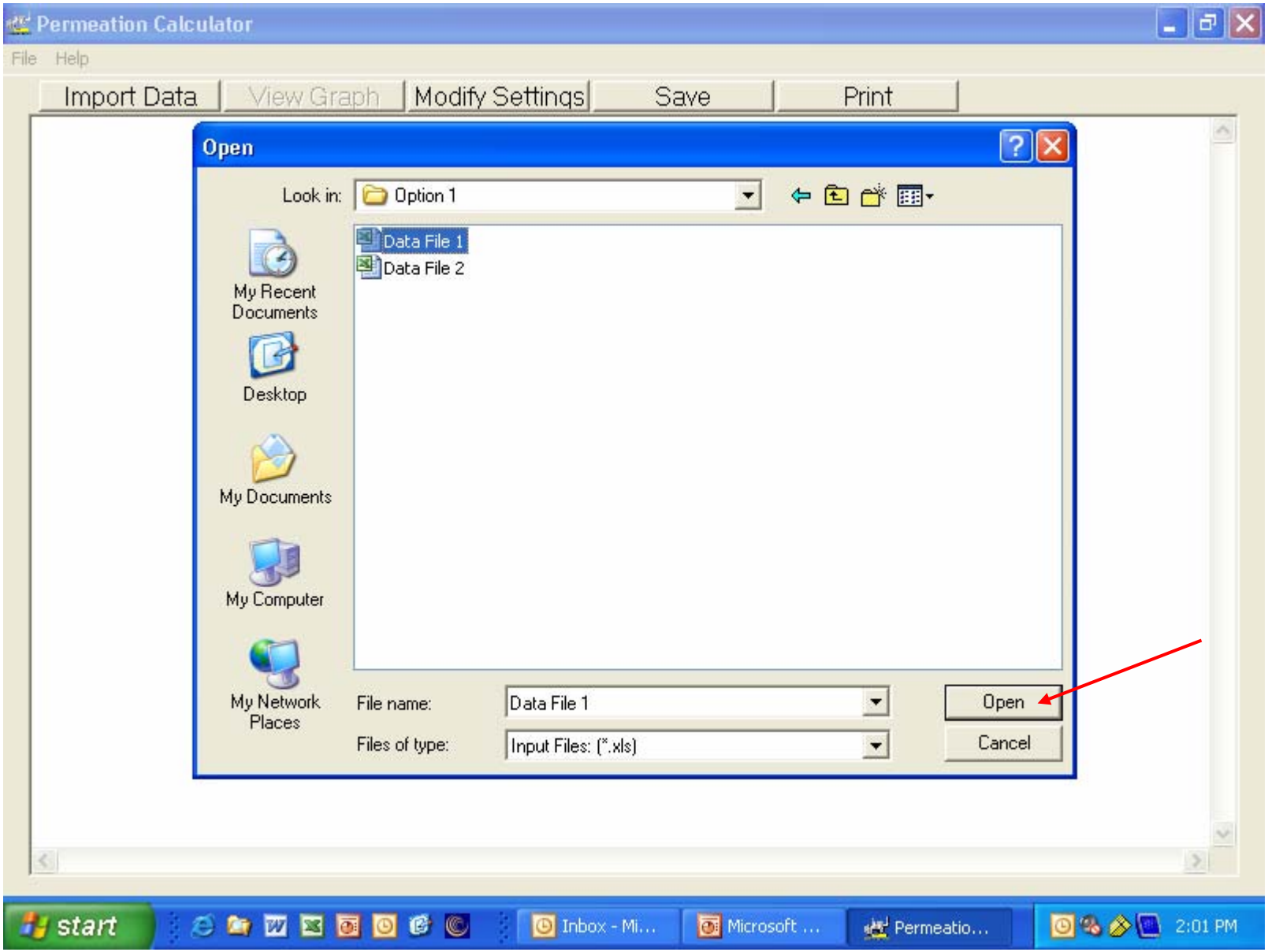

File Help
Import Data
View Graph
Modify Settings
Save
Print
About PermCalc
OK
Permeation Calculator Version 2.4.1
National Personal Protective Technology Laboratory (NPPTL), National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC)
This program calculates breakthrough detection time, standardized breakthrough times (ASTM F739), minimum breakthrough detection time (ASTM D 6978), normalized breakthrough times (ISO 6529), steady-state permeation rate, and cumulative permeation for the data collected from an open or a closed loop permeation test.
Contact Person: Pengfei Gao, Ph.D., CIH <Pcg9@cdc.gov>
Copyright (C) 2004-2008

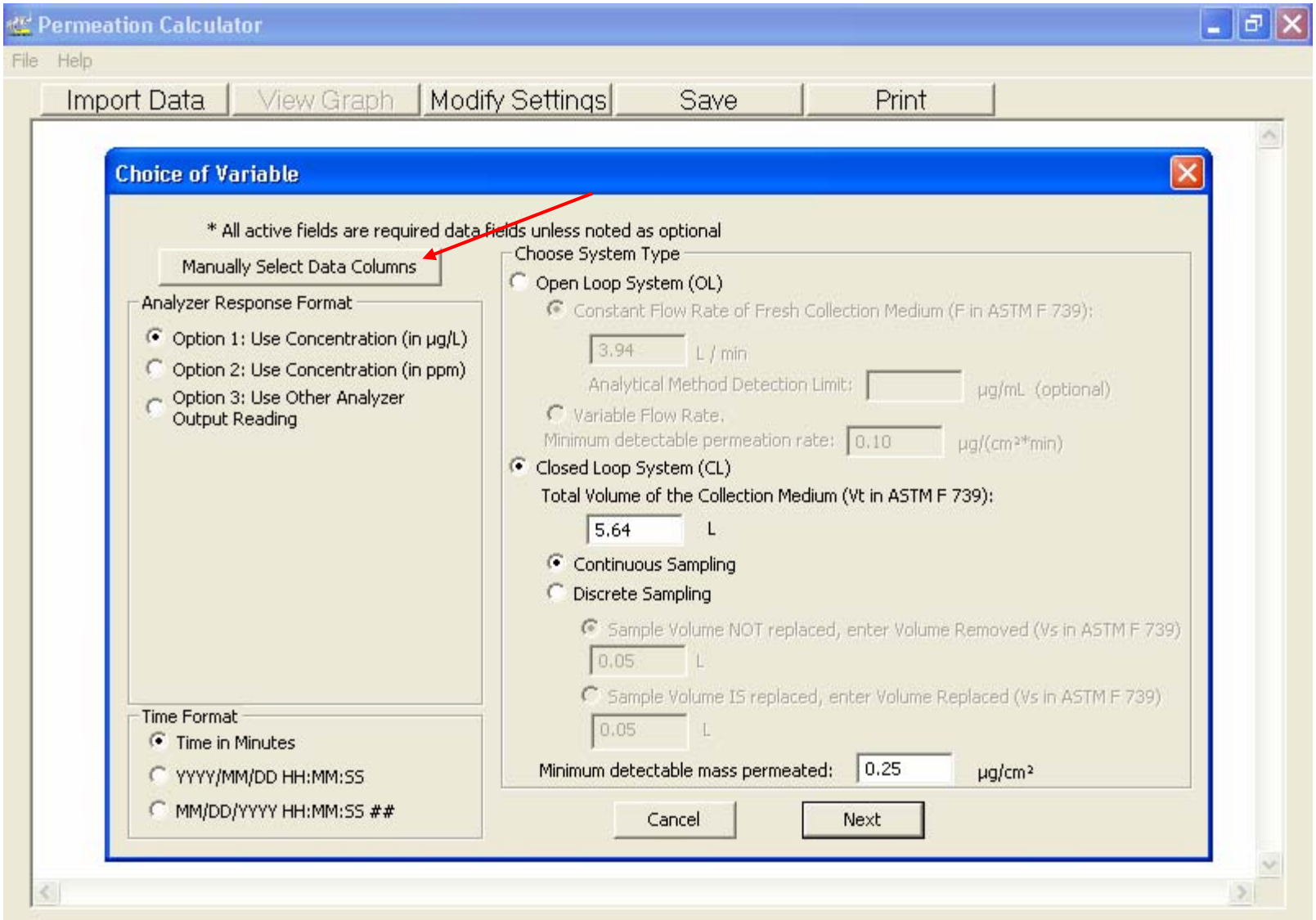

Permeation Calculator
File
Help
About...
Help Topics
View Graph
Modify Settings
Save
Print

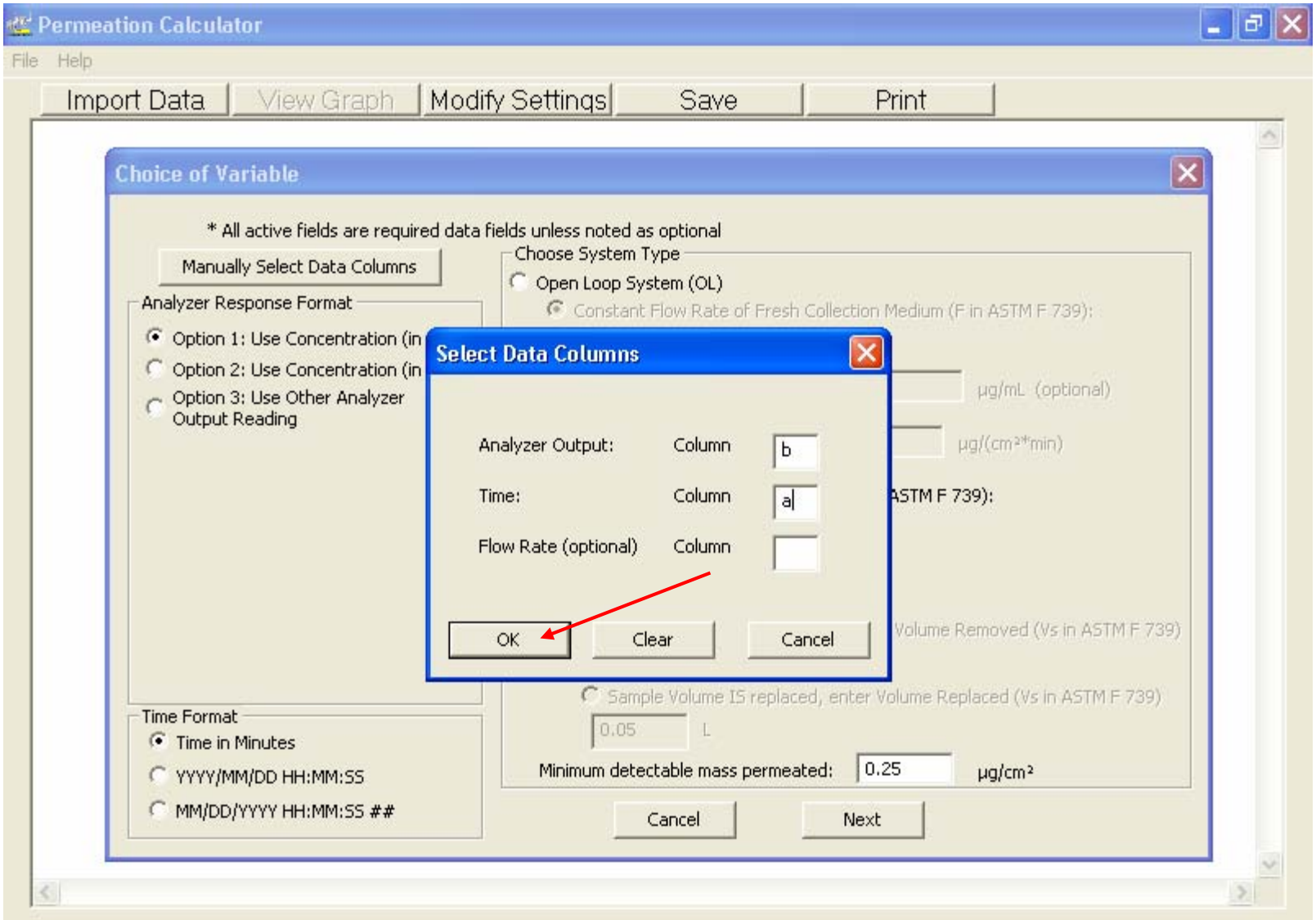

Permeation Calculator
File
Help
Import Data
View Graph
Modify Settings
Save
Print
Help Menu
Topic:
Additional Data Input
Analytical Method Detection Limit
Analytical Technique
Analyzer Output Reading
Analyzer Response Format
ASTM F739 Standardized Breakthrough Time
Average Material Thickness (mm)
Average Permeation Rate
Help:
A window that allows users to enter related testing conditions, such as material type, operator, nominal test temperature, and etc., which are not required when calculating the permeation parameters but will be shown in the result output file for record keeping. 'Finish' is the default action for this window.
OK

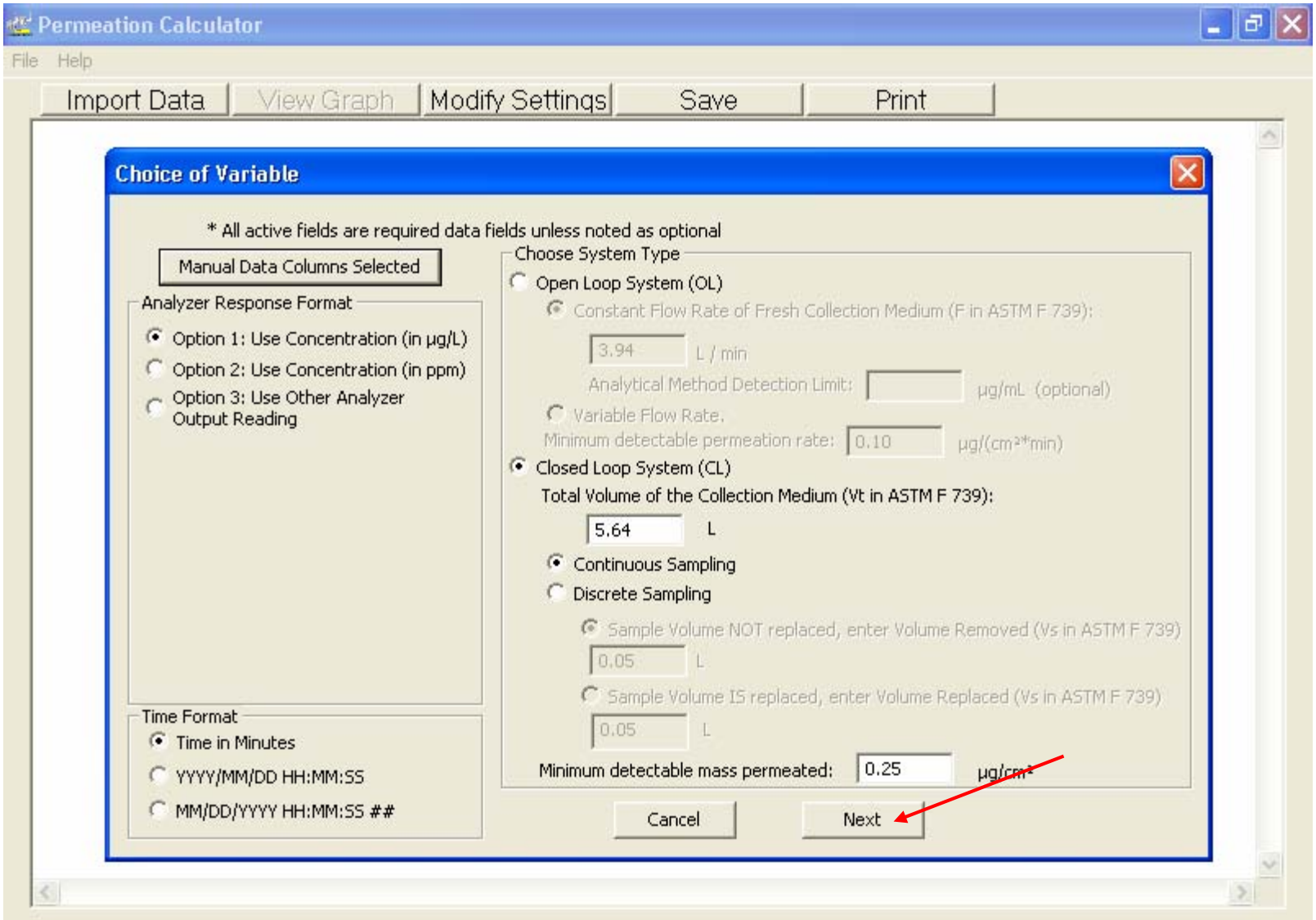

Permeation Calculator
File
Help
Import Data
Modify Settings
View Results Graph
Save
Print
Exit
View Graph
Modify Settings
Save
Print

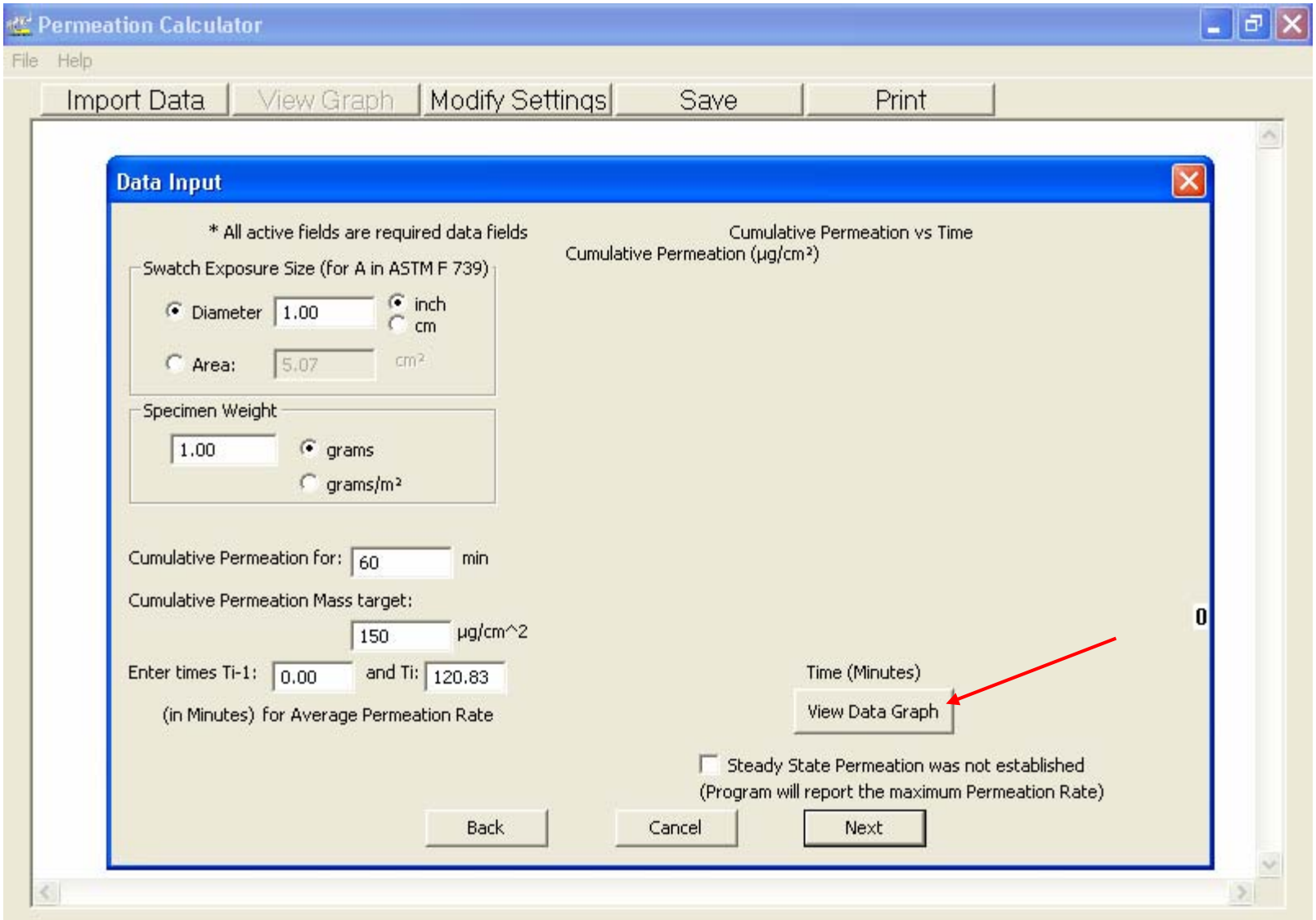

Permeation Calculator
File
Help
Import Data
View Graph
Modify Settings
Save
Print

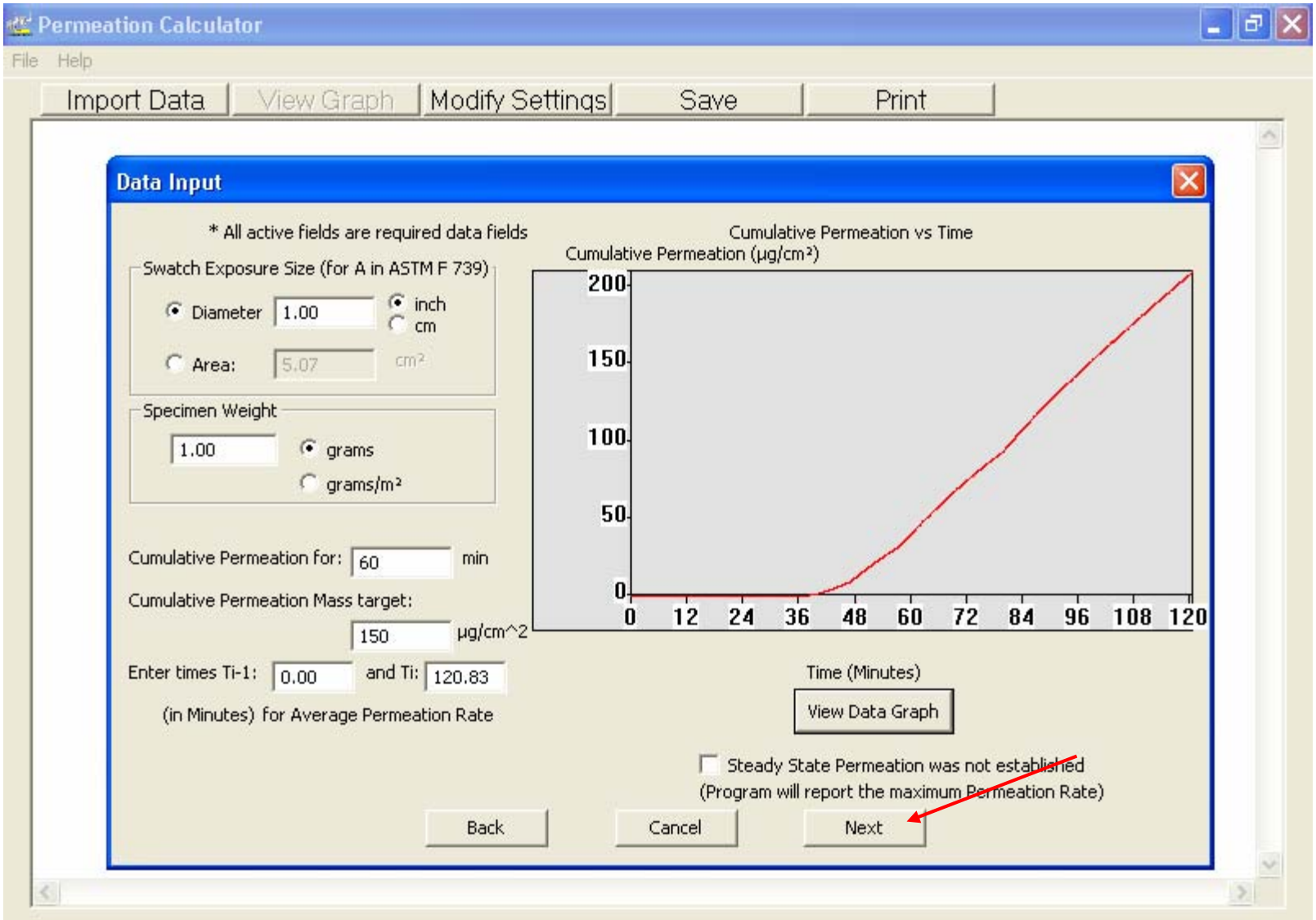

Permeation Calculator
File Help
Import Data
View Graph
Modify Settings
Save
Print
Open
Look in:
Option 1
Data File 1
Data File 2
My Recent Documents
Desktop
My Documents
My Computer
My Network Places
File name:
Data File 1
Files of type:
Input Files: (*.xls)
Open
Cancel
start
Inbox - Mi...
Microsoft ...
Permeatio...
2:01 PM

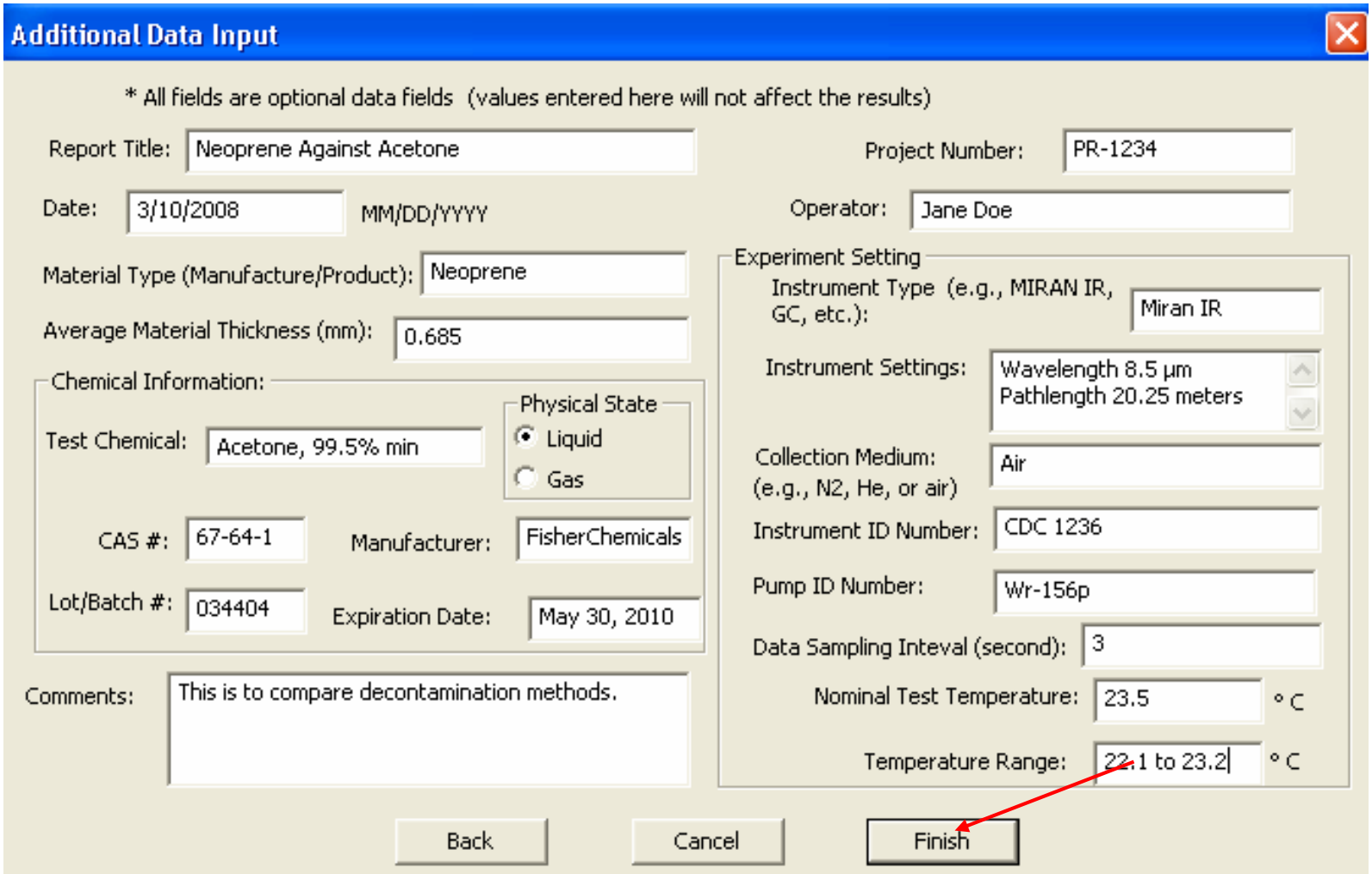

Permeation Calculator
File Help
Import Data
View Graph
Modify Settings
Save
Print
Choice of Variable
* All active fields are required data fields unless noted as optional
Manually Select Data Columns
Analyzer Response Format
Option 1: Use Concentration (in µg/L)
Option 2: Use Concentration (in ppm)
Option 3: Use Other Analyzer Output Reading
Time Format
Time in Minutes
YYYY/MM/DD HH:MM:SS
MM/DD/YYYY HH:MM:SS ##
Choose System Type
Open Loop System (OL)
Constant Flow Rate of Fresh Collection Medium (F in ASTM F 739):
3.94
L / min
Analytical Method Detection Limit:
µg/mL (optional)
Variable Flow Rate.
Minimum detectable permeation rate:
0.10
µg/(cm²*min)
Closed Loop System (CL)
Total Volume of the Collection Medium (Vt in ASTM F 739):
5.64
L
Continuous Sampling
Discrete Sampling
Sample Volume NOT replaced, enter Volume Removed (Vs in ASTM F 739)
0.05
L
Sample Volume IS replaced, enter Volume Replaced (Vs in ASTM F 739)
0.05
L
Minimum detectable mass permeated:
0.25
µg/cm²
Cancel
Next

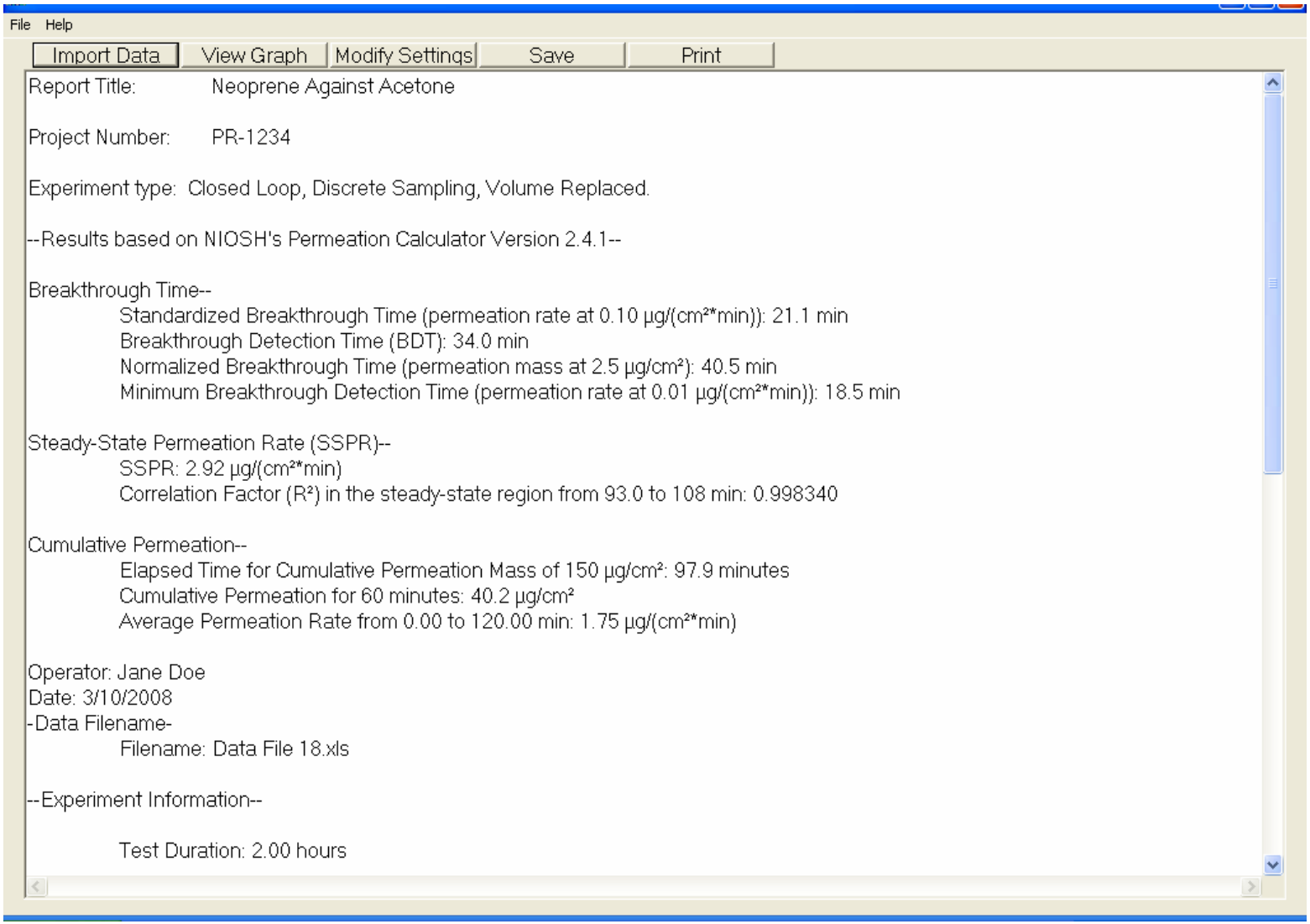

Permeation Calculator
File Help
Import Data
View Graph
Modify Settings
Save
Print
Choice of Variable
* All active fields are required data fields unless noted as optional
Manually Select Data Columns
Analyzer Response Format
Option 1: Use Concentration (in
Option 2: Use Concentration (in
Option 3: Use Other Analyzer Output Reading
Time Format
Time in Minutes
YYYY/MM/DD HH:MM:SS
MM/DD/YYYY HH:MM:SS ##
Choose System Type
Open Loop System (OL)
Constant Flow Rate of Fresh Collection Medium (F in ASTM F 739):
µg/mL (optional)
µg/(cm²*min)
ASTM F 739):
Volume Removed (Vs in ASTM F 739)
Sample Volume IS replaced, enter Volume Replaced (Vs in ASTM F 739)
0.05
L
Minimum detectable mass permeated:
0.25
µg/cm²
Cancel
Next
Select Data Columns
Analyzer Output: Column b
Time: Column a
Flow Rate (optional) Column
OK
Clear
Cancel

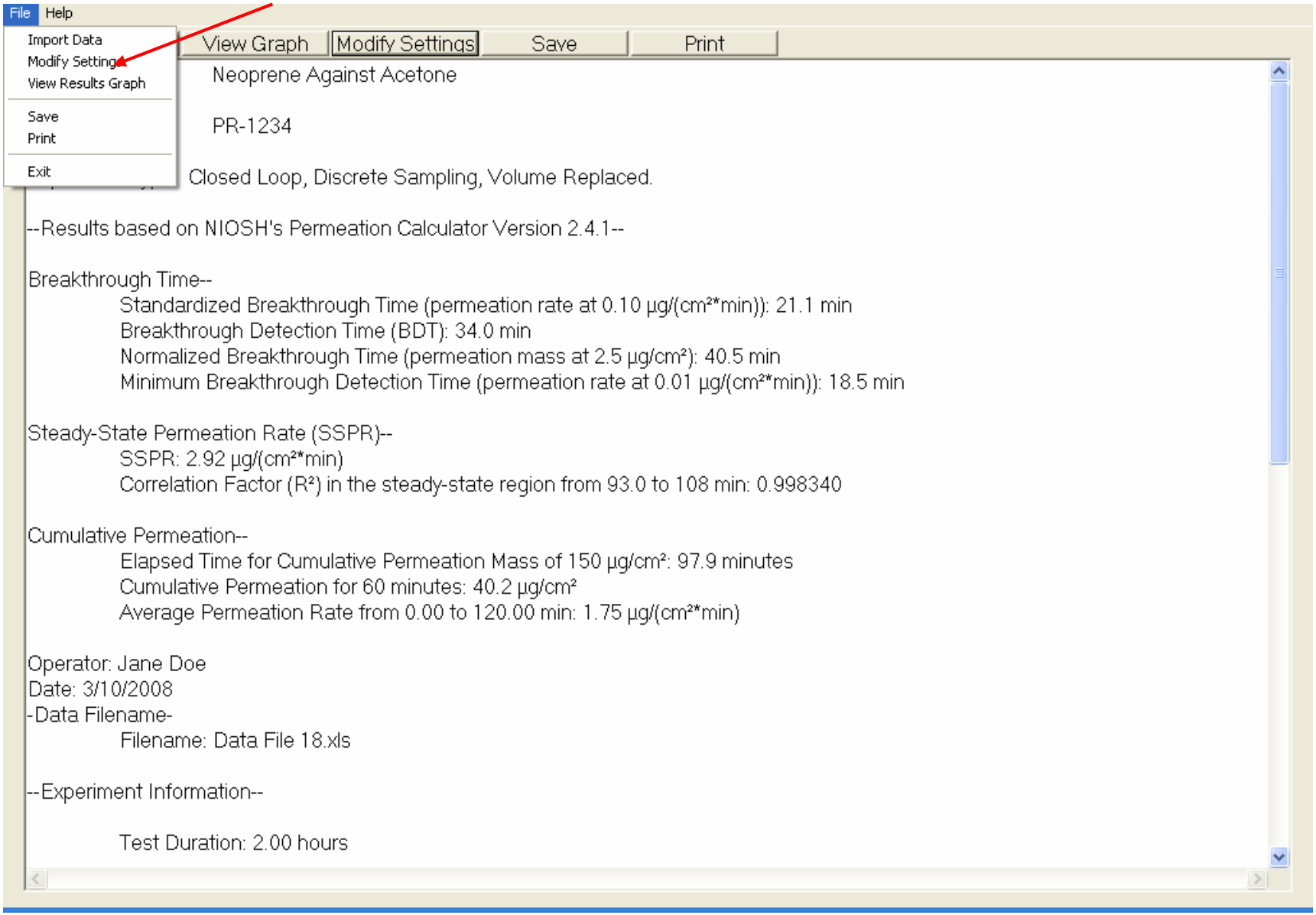

Permeation Calculator
File Help
Import Data
View Graph
Modify Settings
Save
Print
Choice of Variable
* All active fields are required data fields unless noted as optional
Manual Data Columns Selected
Analyzer Response Format
Option 1: Use Concentration (in µg/L)
Option 2: Use Concentration (in ppm)
Option 3: Use Other Analyzer Output Reading
Time Format
Time in Minutes
YYYY/MM/DD HH:MM:SS
MM/DD/YYYY HH:MM:SS ##
Choose System Type
Open Loop System (OL)
Constant Flow Rate of Fresh Collection Medium (F in ASTM F 739):
3.94
L / min
Analytical Method Detection Limit:
µg/mL (optional)
Variable Flow Rate.
Minimum detectable permeation rate:
0.10
µg/(cm²*min)
Closed Loop System (CL)
Total Volume of the Collection Medium (Vt in ASTM F 739):
5.64
L
Continuous Sampling
Discrete Sampling
Sample Volume NOT replaced, enter Volume Removed (Vs in ASTM F 739)
0.05
L
Sample Volume IS replaced, enter Volume Replaced (Vs in ASTM F 739)
0.05
L
Minimum detectable mass permeated:
0.25
µg/cm²
Cancel
Next

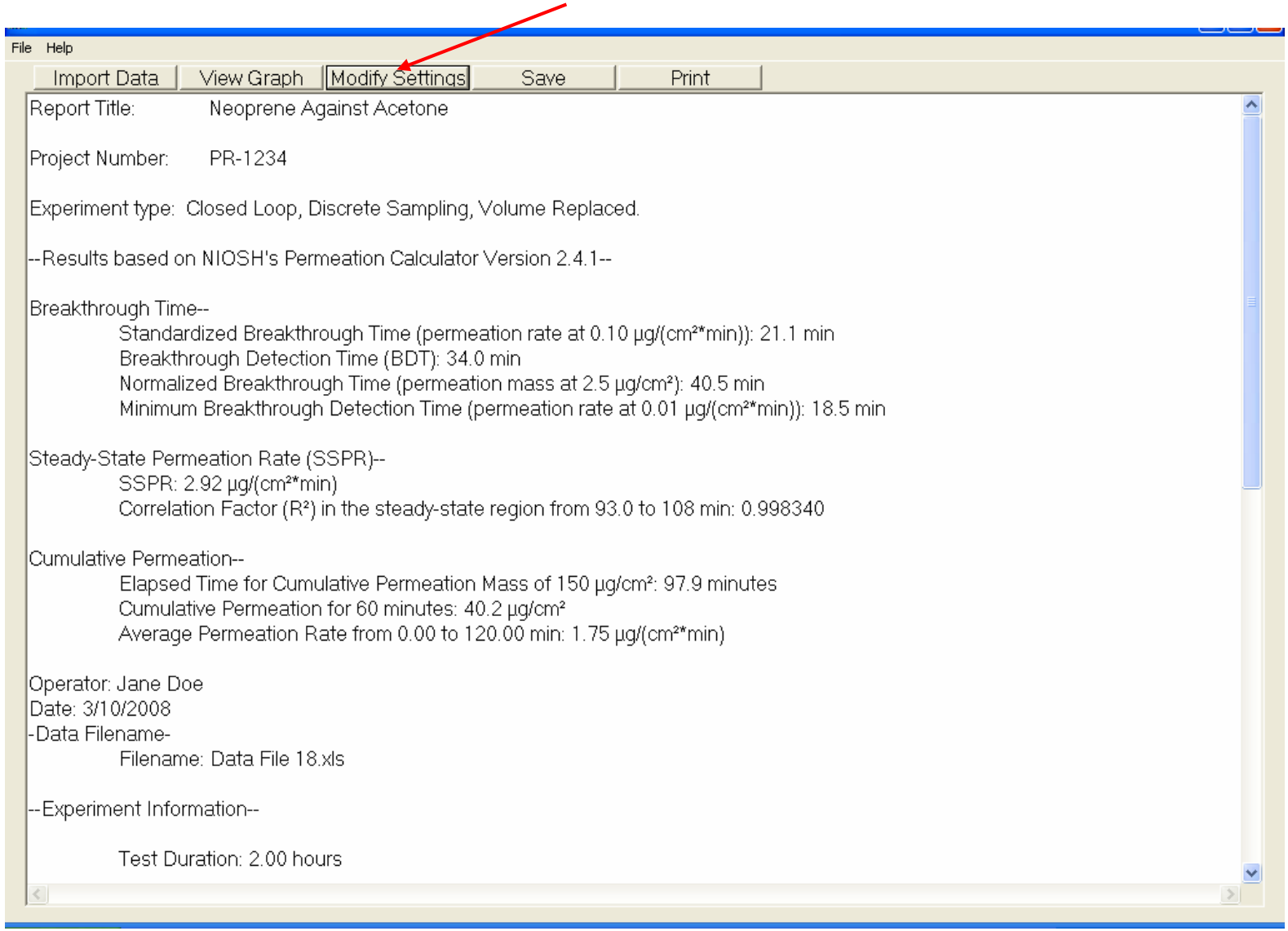

Permeation Calculator
File Help
Import Data
View Graph
Modify Settings
Save
Print
Data Input
* All active fields are required data fields
Swatch Exposure Size (for A in ASTM F 739)
Diameter 1.00
inch
cm
Area: 5.07 cm²
Specimen Weight
1.00
grams
grams/m²
Cumulative Permeation for: 60 min
Cumulative Permeation Mass target:
150 µg/cm^2
Enter times Ti-1: 0.00 and Ti: 120.83
(in Minutes) for Average Permeation Rate
Cumulative Permeation vs Time
Cumulative Permeation (µg/cm²)
0
Time (Minutes)
View Data Graph
Steady State Permeation was not established
(Program will report the maximum Permeation Rate)
Back
Cancel
Next


Permeation Calculator
File Help
Import Data
View Graph
Modify Settings
Save
Print
Data Input
* All active fields are required data fields
Swatch Exposure Size (for A in ASTM F 739)
Diameter 1.00
inch
cm
Area: 5.07 cm²
Specimen Weight
1.00
grams
grams/m²
Cumulative Permeation for: 60 min
Cumulative Permeation Mass target:
150 µg/cm^2
Enter times Ti-1: 0.00 and Ti: 120.83
(in Minutes) for Average Permeation Rate
Cumulative Permeation vs Time
Cumulative Permeation (µg/cm²)
200
150
100
50
0
0 12 24 36 48 60 72 84 96 108 120
Time (Minutes)
View Data Graph
Steady State Permeation was not established
(Program will report the maximum Permeation Rate)
Back
Cancel
Next


Additional Data Input
* All fields are optional data fields (values entered here will not affect the results)
Report Title: Neoprene Against Acetone
Project Number: PR-1234
Date: 3/10/2008
MM/DD/YYYY
Operator: Jane Doe
Material Type (Manufacture/Product): Neoprene
Average Material Thickness (mm): 0.685
Chemical Information:
Test Chemical: Acetone, 99.5% min
Physical State
Liquid
Gas
CAS #: 67-64-1
Manufacturer: FisherChemicals
Lot/Batch #: 034404
Expiration Date: May 30, 2010
Comments: This is to compare decontamination methods.
Experiment Setting
Instrument Type (e.g., MIRAN IR, GC, etc.): Miran IR
Instrument Settings: Wavelength 8.5 µm
Pathlength 20.25 meters
Collection Medium: (e.g., N2, He, or air) Air
Instrument ID Number: CDC 1236
Pump ID Number: Wr-156p
Data Sampling Inteval (second): 3
Nominal Test Temperature: 23.5 °C
Temperature Range: 22.1 to 23.2 °C
Back
Cancel
Finish


File Help
Import Data
View Graph
Modify Settings
Save
Print
Report Title: Neoprene Against Acetone
Project Number: PR-1234
Experiment type: Closed Loop, Discrete Sampling, Volume Replaced.
--Results based on NIOSH's Permeation Calculator Version 2.4.1--
Breakthrough Time--
Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 21.1 min
Breakthrough Detection Time (BDT): 34.0 min
Normalized Breakthrough Time (permeation mass at 2.5 µg/cm²): 40.5 min
Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)): 18.5 min
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R²) in the steady-state region from 93.0 to 108 min: 0.998340
Cumulative Permeation--
Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 97.9 minutes
Cumulative Permeation for 60 minutes: 40.2 µg/cm²
Average Permeation Rate from 0.00 to 120.00 min: 1.75 µg/(cm²*min)
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours


File
Help
Import Data
Modify Settings
View Results Graph
Save
Print
Exit
View Graph
Modify Settings
Save
Print
Neoprene Against Acetone
PR-1234
Closed Loop, Discrete Sampling, Volume Replaced.
--Results based on NIOSH's Permeation Calculator Version 2.4.1--
Breakthrough Time--
Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 21.1 min
Breakthrough Detection Time (BDT): 34.0 min
Normalized Breakthrough Time (permeation mass at 2.5 µg/cm²): 40.5 min
Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)): 18.5 min
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R²) in the steady-state region from 93.0 to 108 min: 0.998340
Cumulative Permeation--
Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 97.9 minutes
Cumulative Permeation for 60 minutes: 40.2 µg/cm²
Average Permeation Rate from 0.00 to 120.00 min: 1.75 µg/(cm²*min)
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours


File Help
Import Data
View Graph
Modify Settings
Save
Print
Report Title: Neoprene Against Acetone
Project Number: PR-1234
Experiment type: Closed Loop, Discrete Sampling, Volume Replaced.
--Results based on NIOSH's Permeation Calculator Version 2.4.1--
Breakthrough Time--
Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 21.1 min
Breakthrough Detection Time (BDT): 34.0 min
Normalized Breakthrough Time (permeation mass at 2.5 µg/cm²): 40.5 min
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SSPR: 2.92 µg/(cm²*min)
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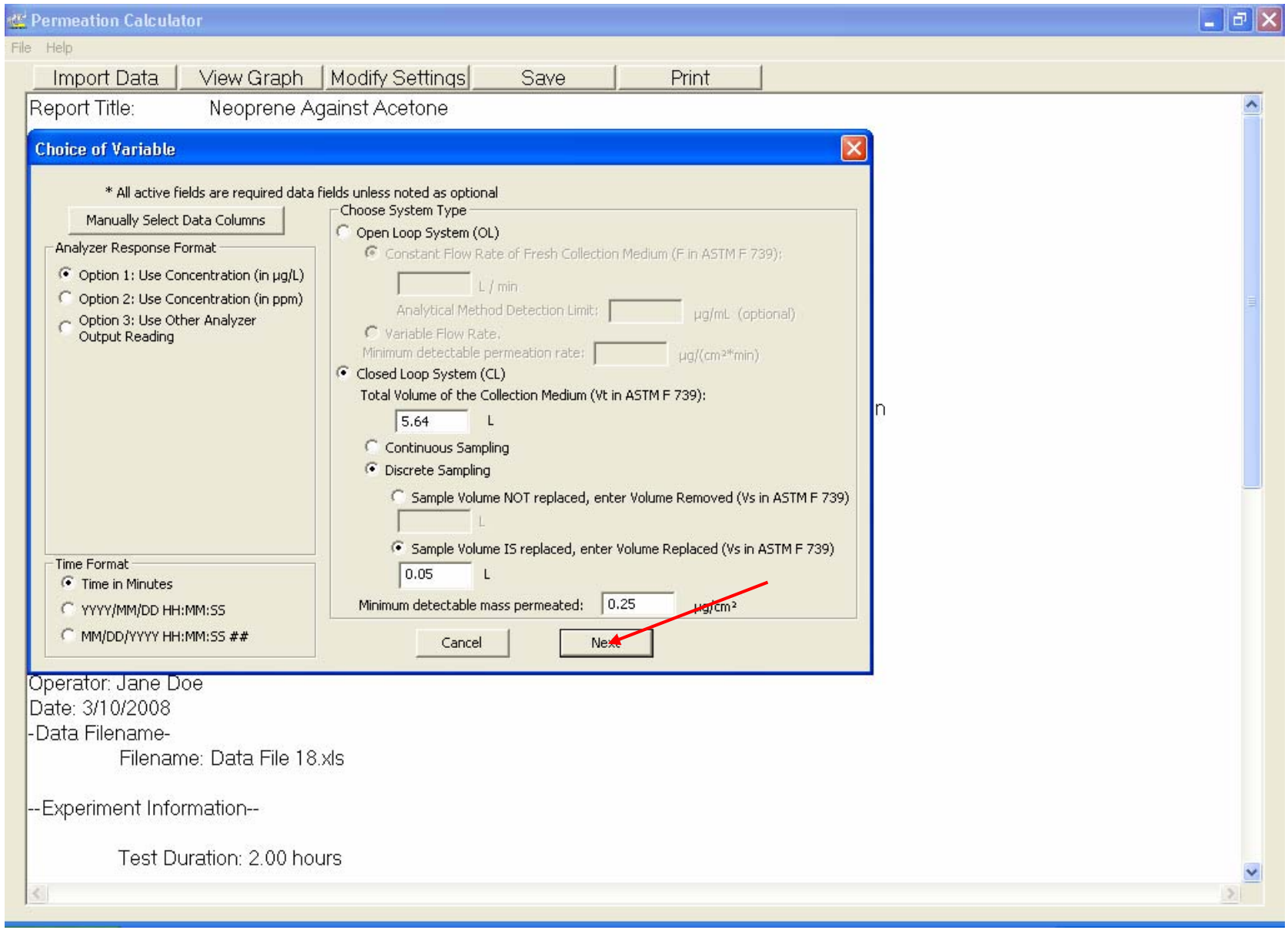
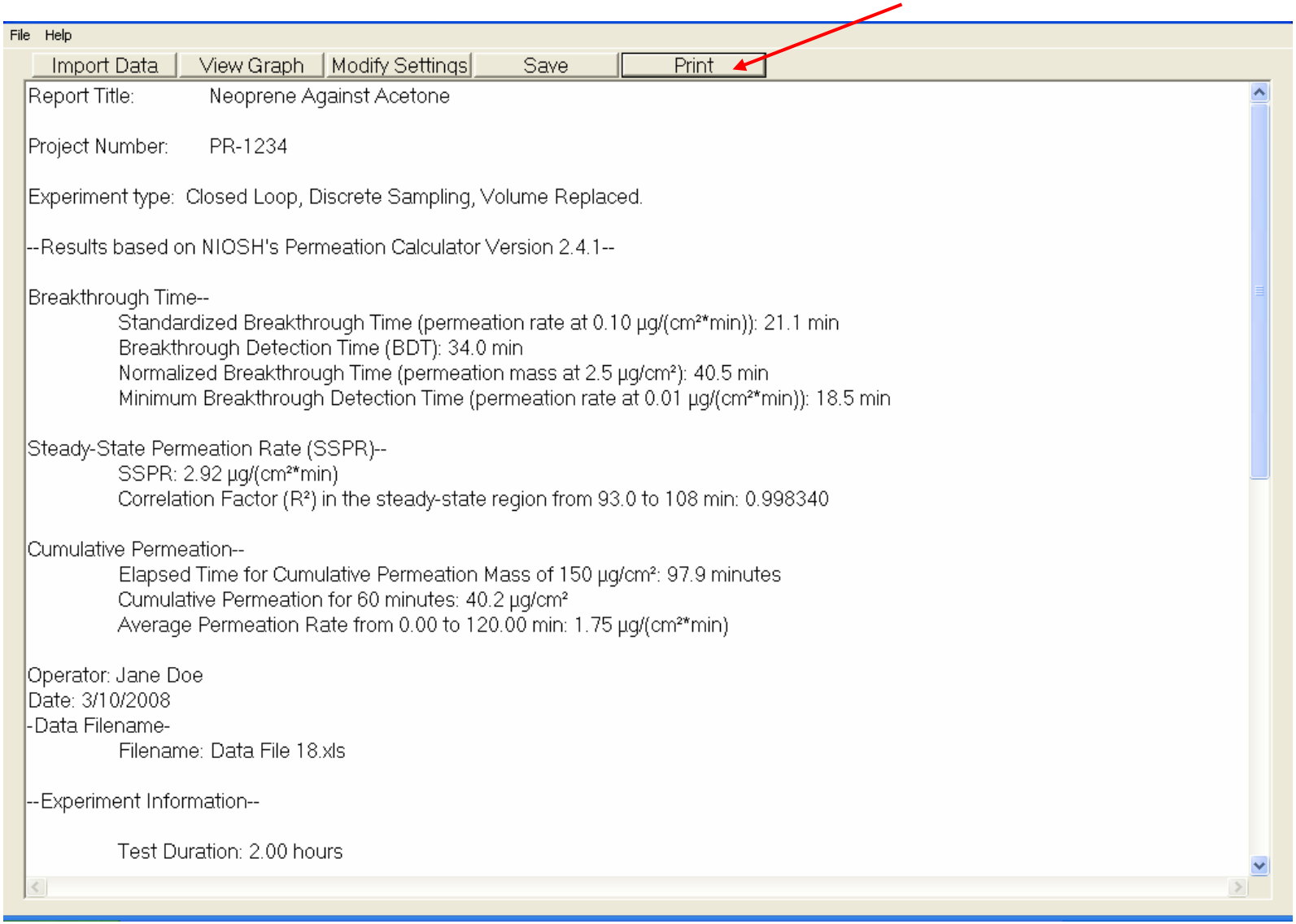
Cumulative Permeation--
Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 97.9 minutes
Cumulative Permeation for 60 minutes: 40.2 µg/cm²
Average Permeation Rate from 0.00 to 120.00 min: 1.75 µg/(cm²*min)
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours


Permeation Calculator
File Help
Import Data
View Graph
Modify Settings
Save
Print
Report Title: Neoprene Against Acetone
Choice of Variable
* All active fields are required data fields unless noted as optional
Manually Select Data Columns
Analyzer Response Format
Option 1: Use Concentration (in µg/L)
Option 2: Use Concentration (in ppm)
Option 3: Use Other Analyzer Output Reading
Time Format
Time in Minutes
YYYY/MM/DD HH:MM:SS
MM/DD/YYYY HH:MM:SS ##
Choose System Type
Open Loop System (OL)
Constant Flow Rate of Fresh Collection Medium (F in ASTM F 739):
L / min
Analytical Method Detection Limit:
µg/mL (optional)
Variable Flow Rate.
Minimum detectable permeation rate:
µg/(cm²*min)
Closed Loop System (CL)
Total Volume of the Collection Medium (Vt in ASTM F 739):
5.64
L
Continuous Sampling
Discrete Sampling
Sample Volume NOT replaced, enter Volume Removed (Vs in ASTM F 739)
L
Sample Volume IS replaced, enter Volume Replaced (Vs in ASTM F 739)
0.05
L
Minimum detectable mass permeated:
0.25
µg/cm²
Cancel
Next
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours


File Help
Import Data
View Graph
Modify Settings
Save
Print
Report Title: Neoprene Against Acetone
Project Number: PR-1234
Experiment type: Closed Loop, Discrete Sampling, Volume Replaced.
--Results based on NIOSH's Permeation Calculator Version 2.4.1--
Breakthrough Time--
Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 21.1 min
Breakthrough Detection Time (BDT): 34.0 min
Normalized Breakthrough Time (permeation mass at 2.5 µg/cm²): 40.5 min
Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)): 18.5 min
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R²) in the steady-state region from 93.0 to 108 min: 0.998340
Cumulative Permeation--
Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 97.9 minutes
Cumulative Permeation for 60 minutes: 40.2 µg/cm²
Average Permeation Rate from 0.00 to 120.00 min: 1.75 µg/(cm²*min)
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours

File Help

Import Data | View Graph | Modify Settings | Save | Print

Report Title: Neoprene Against Acetone

Project Number: PR-1234

Experiment type: Closed Loop, Discrete Sampling, Volume Replaced.

--Results based on NIOSH's Permeation Calculator Version 2.4.1--

Breakthrough Time--
Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 21.1 min
Breakthrough Detection Time (BDT): 34.0 min
Normalized Breakthrough Time (permeation mass at 2.5 µg/cm²): 40.5 min
Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)): 18.5 min

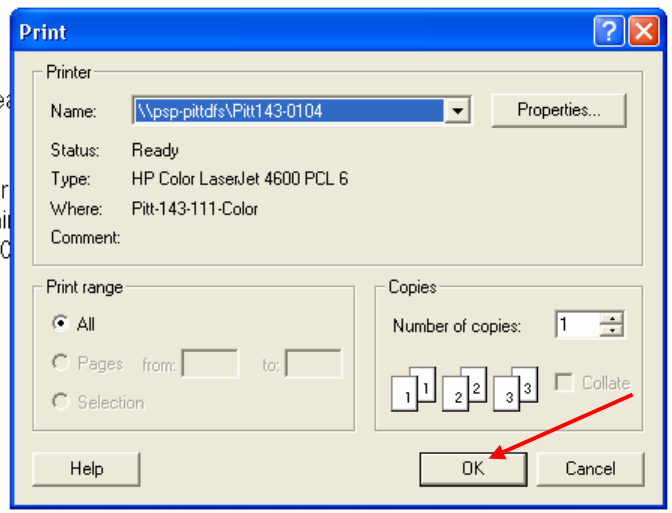
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R^2) in the ste

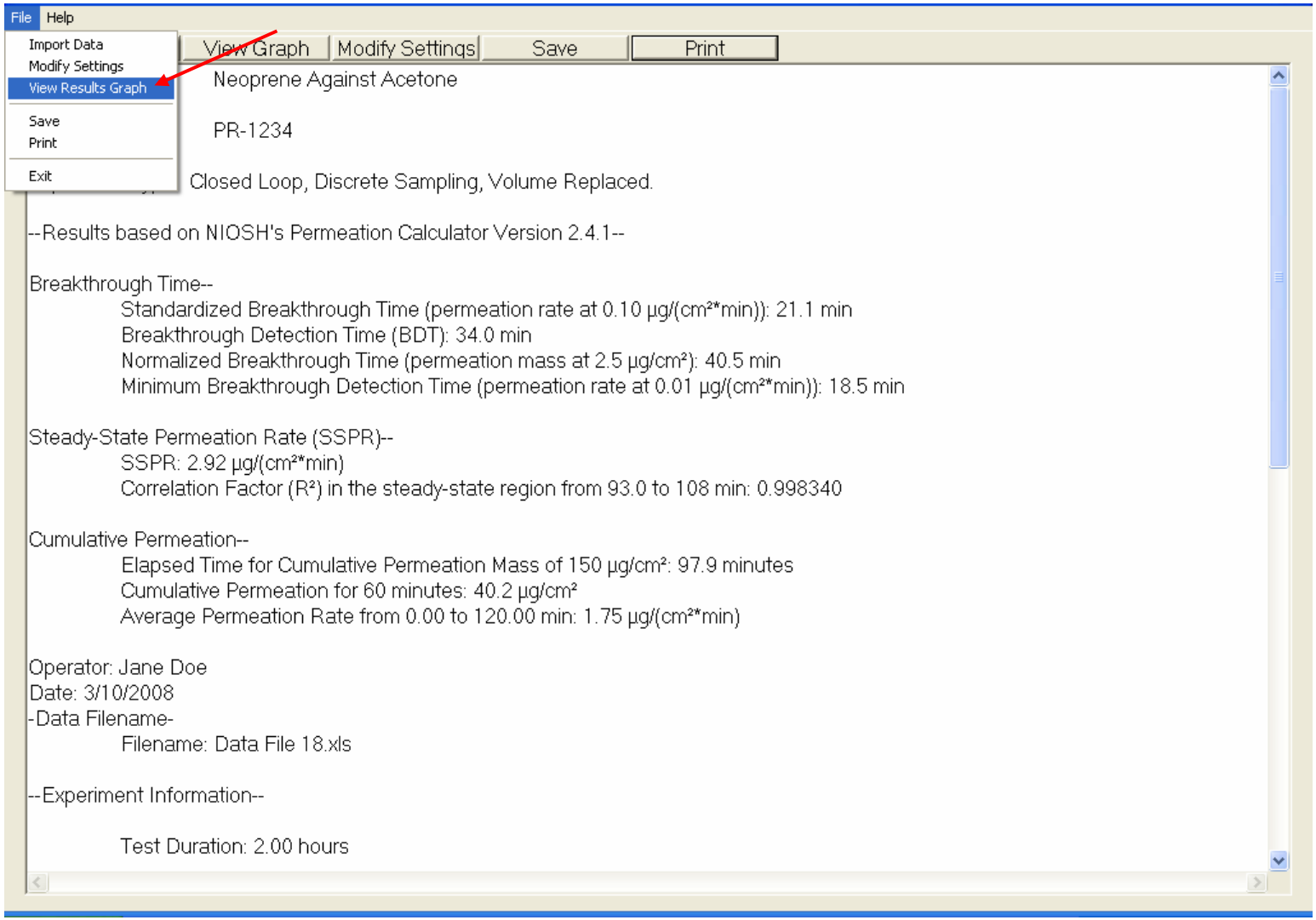
Cumulative Permeation--
Elapsed Time for Cumulative Per
Cumulative Permeation for 60 mi
Average Permeation Rate from 0

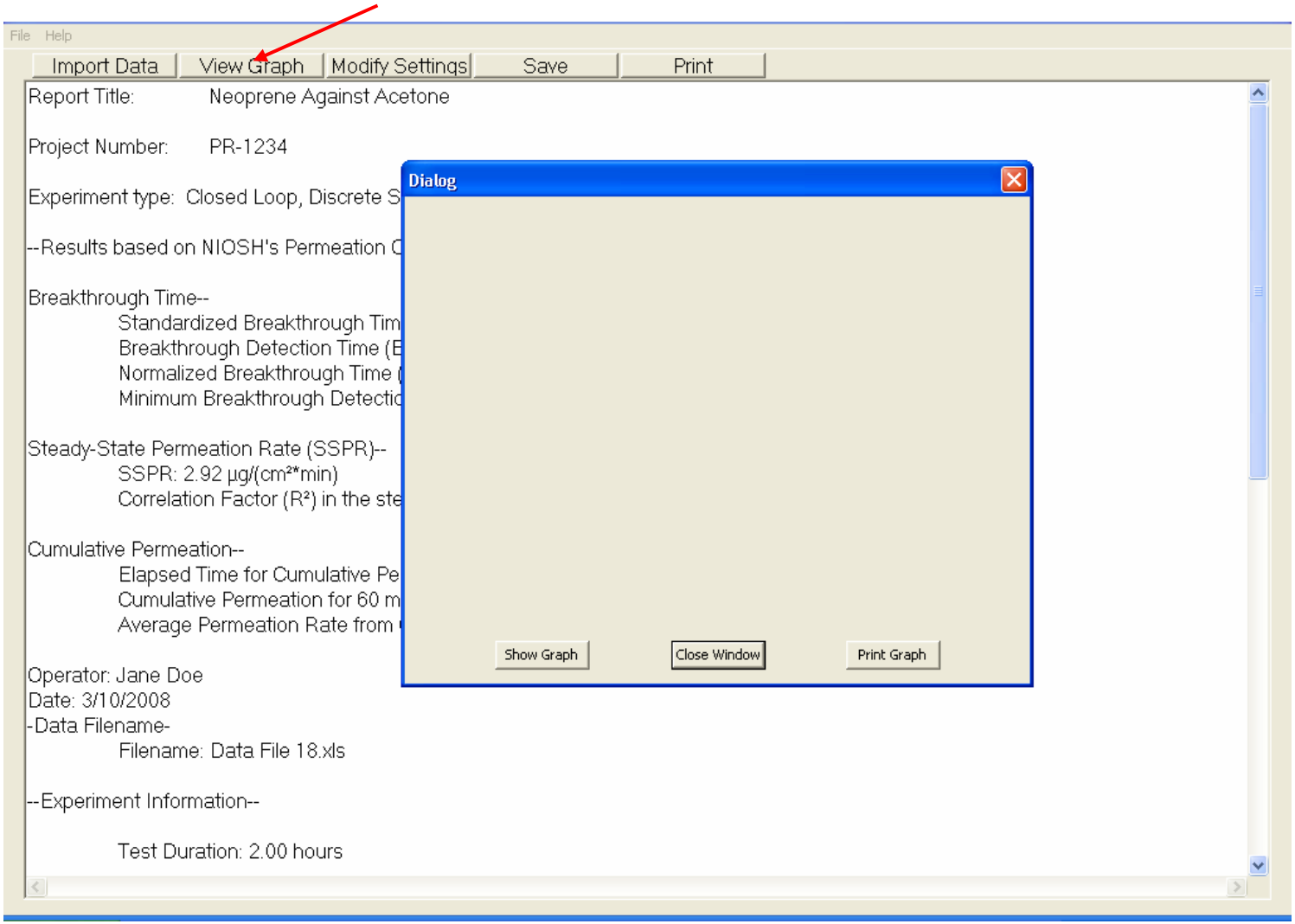
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls

--Experiment Information--

Test Duration: 2.00 hours




File
Help
Import Data
Modify Settings
View Results Graph
Save
Print
Exit
View Graph
Modify Settings
Save
Print
Neoprene Against Acetone
PR-1234
Closed Loop, Discrete Sampling, Volume Replaced.
--Results based on NIOSH's Permeation Calculator Version 2.4.1--
Breakthrough Time--
Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 21.1 min
Breakthrough Detection Time (BDT): 34.0 min
Normalized Breakthrough Time (permeation mass at 2.5 µg/cm²): 40.5 min
Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)): 18.5 min
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R²) in the steady-state region from 93.0 to 108 min: 0.998340
Cumulative Permeation--
Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 97.9 minutes
Cumulative Permeation for 60 minutes: 40.2 µg/cm²
Average Permeation Rate from 0.00 to 120.00 min: 1.75 µg/(cm²*min)
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours


File Help
Import Data
View Graph
Modify Settings
Save
Print
Report Title: Neoprene Against Acetone
Project Number: PR-1234
Experiment type: Closed Loop, Discrete S
--Results based on NIOSH's Permeation C
Breakthrough Time--
Standardized Breakthrough Tim
Breakthrough Detection Time (E
Normalized Breakthrough Time (
Minimum Breakthrough Detectio
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R²) in the ste
Cumulative Permeation--
Elapsed Time for Cumulative Pe
Cumulative Permeation for 60 m
Average Permeation Rate from
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours
Dialog
Show Graph
Close Window
Print Graph

File Help

Import Data | View Graph | Modify Settings | Save | Print

Report Title: Neoprene Against Acetone

Project Number: PR-1234

Experiment type: Closed Loop, Discrete S

--Results based on NIOSH's Permeation C

Breakthrough Time--
Standardized Breakthrough Tim
Breakthrough Detection Time (E
Normalized Breakthrough Time (
Minimum Breakthrough Detecti

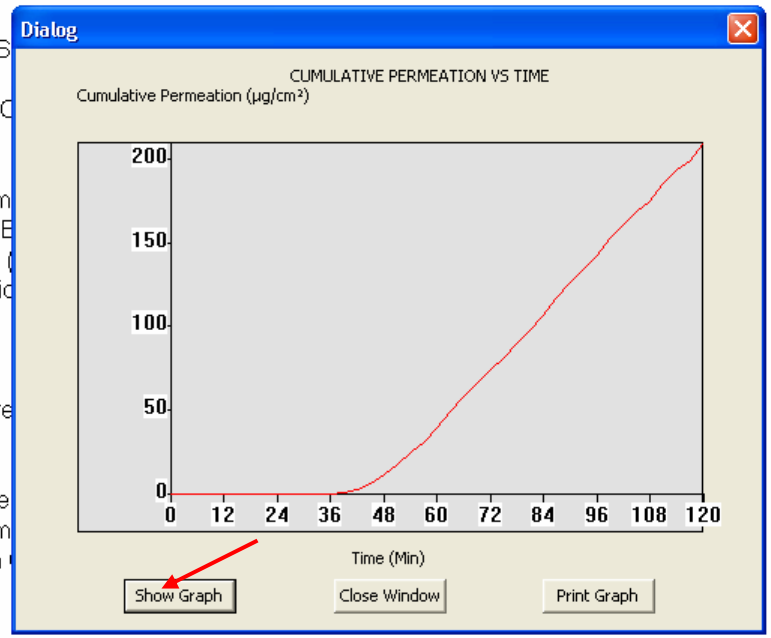
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R^2) in the ste

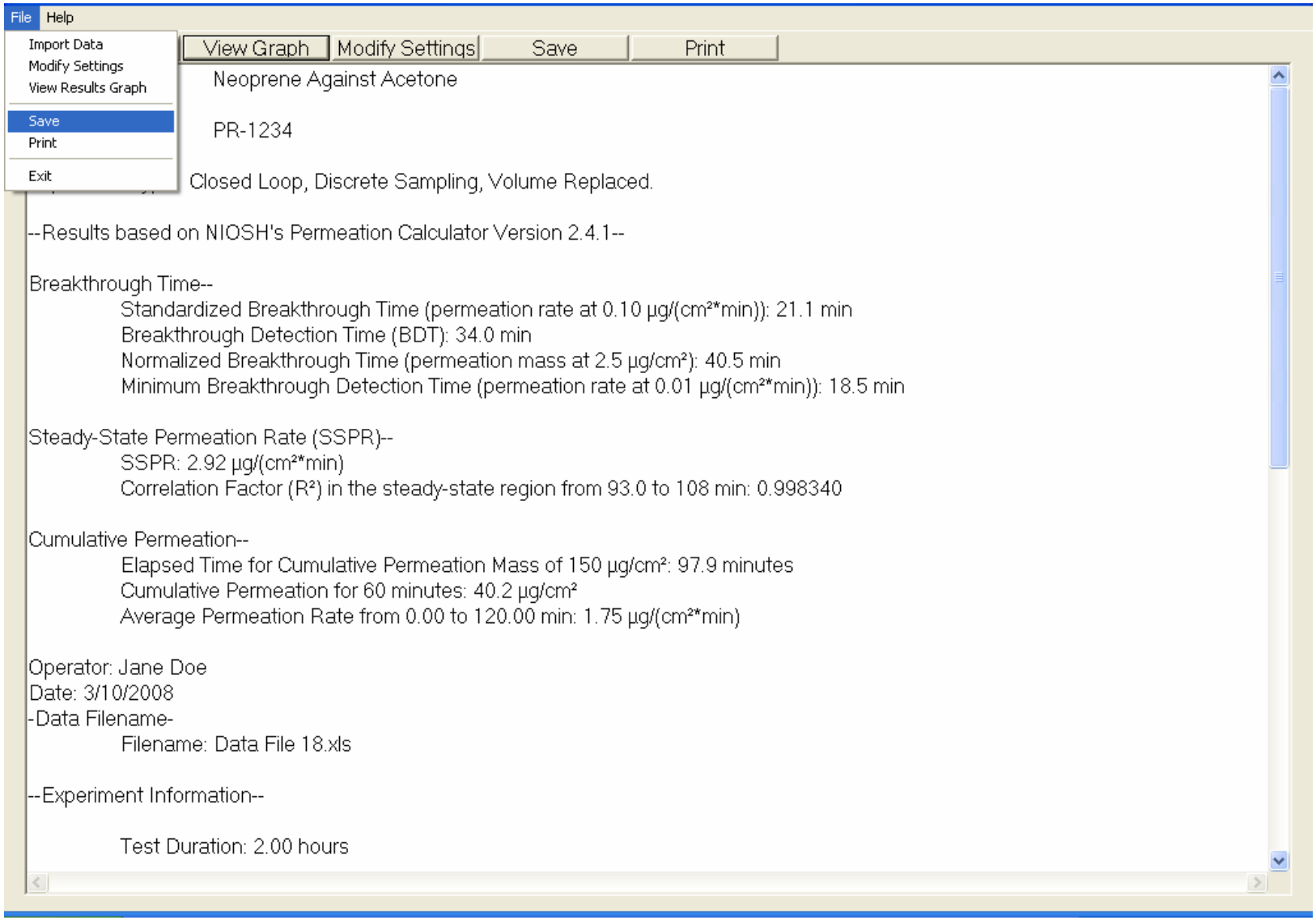
Cumulative Permeation--
Elapsed Time for Cumulative Pe
Cumulative Permeation for 60 m
Average Permeation Rate from

Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls

--Experiment Information--

Test Duration: 2.00 hours




File
Help
Import Data
Modify Settings
View Results Graph
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View Graph
Modify Settings
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Neoprene Against Acetone
PR-1234
Closed Loop, Discrete Sampling, Volume Replaced.
--Results based on NIOSH's Permeation Calculator Version 2.4.1--
Breakthrough Time--
Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 21.1 min
Breakthrough Detection Time (BDT): 34.0 min
Normalized Breakthrough Time (permeation mass at 2.5 µg/cm²): 40.5 min
Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)): 18.5 min
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R²) in the steady-state region from 93.0 to 108 min: 0.998340
Cumulative Permeation--
Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 97.9 minutes
Cumulative Permeation for 60 minutes: 40.2 µg/cm²
Average Permeation Rate from 0.00 to 120.00 min: 1.75 µg/(cm²*min)
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours

File Help

Import Data | View Graph | Modify Settings | Save | Print

Report Title: Neoprene Against Acetone

Project Number: PR-1234

Experiment type: Closed Loop, Discrete Sampling, Volume Replaced.

--Results based on NIOSH's Permeation Calculator Version 2.4.1--

Breakthrough Time--
- Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 21.1 min
- Breakthrough Detection Time (BDT): 34.0 min
- Normalized Breakthrough Time (permeation mass at 2.5 µg/cm²): 40.5 min
- Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)): 18.5 min

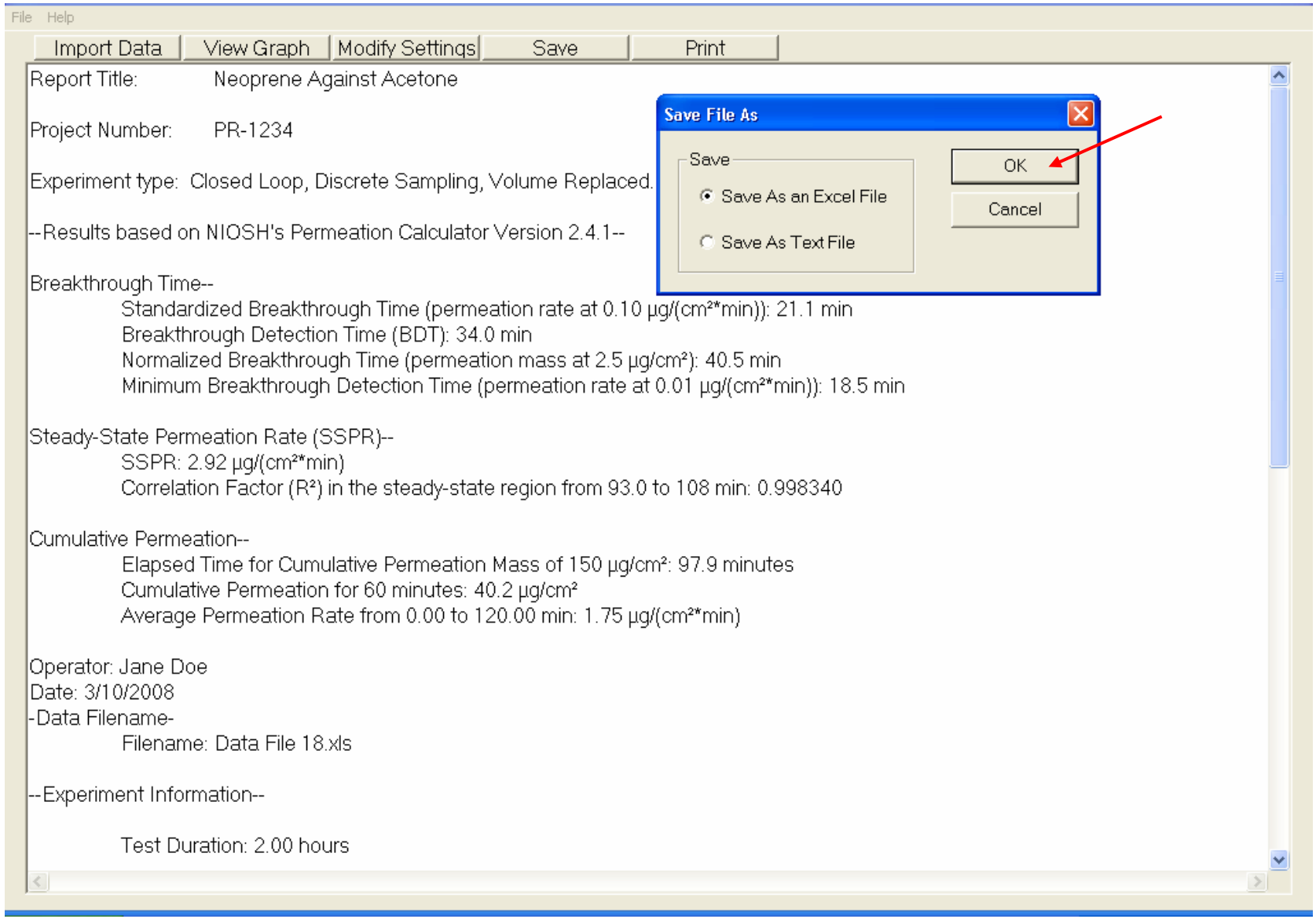
Steady-State Permeation Rate (SSPR)--
- SSPR: 2.92 µg/(cm²*min)
- Correlation Factor (R^2) in the steady-state region from 93.0 to 108 min: 0.998340

Cumulative Permeation--
- Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 97.9 minutes
- Cumulative Permeation for 60 minutes: 40.2 µg/cm²
- Average Permeation Rate from 0.00 to 120.00 min: 1.75 µg/(cm²*min)

Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
- Filename: Data File 18.xls

--Experiment Information--

- Test Duration: 2.00 hours


File Help
Import Data
View Graph
Modify Settings
Save
Print
Report Title: Neoprene Against Acetone
Project Number: PR-1234
Experiment type: Closed Loop, Discrete Sampling, Volume Replaced.
--Results based on NIOSH's Permeation Calculator Version 2.4.1--
Breakthrough Time--
Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 21.1 min
Breakthrough Detection Time (BDT): 34.0 min
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SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R²) in the steady-state region from 93.0 to 108 min: 0.998340
Cumulative Permeation--
Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 97.9 minutes
Cumulative Permeation for 60 minutes: 40.2 µg/cm²
Average Permeation Rate from 0.00 to 120.00 min: 1.75 µg/(cm²*min)
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours
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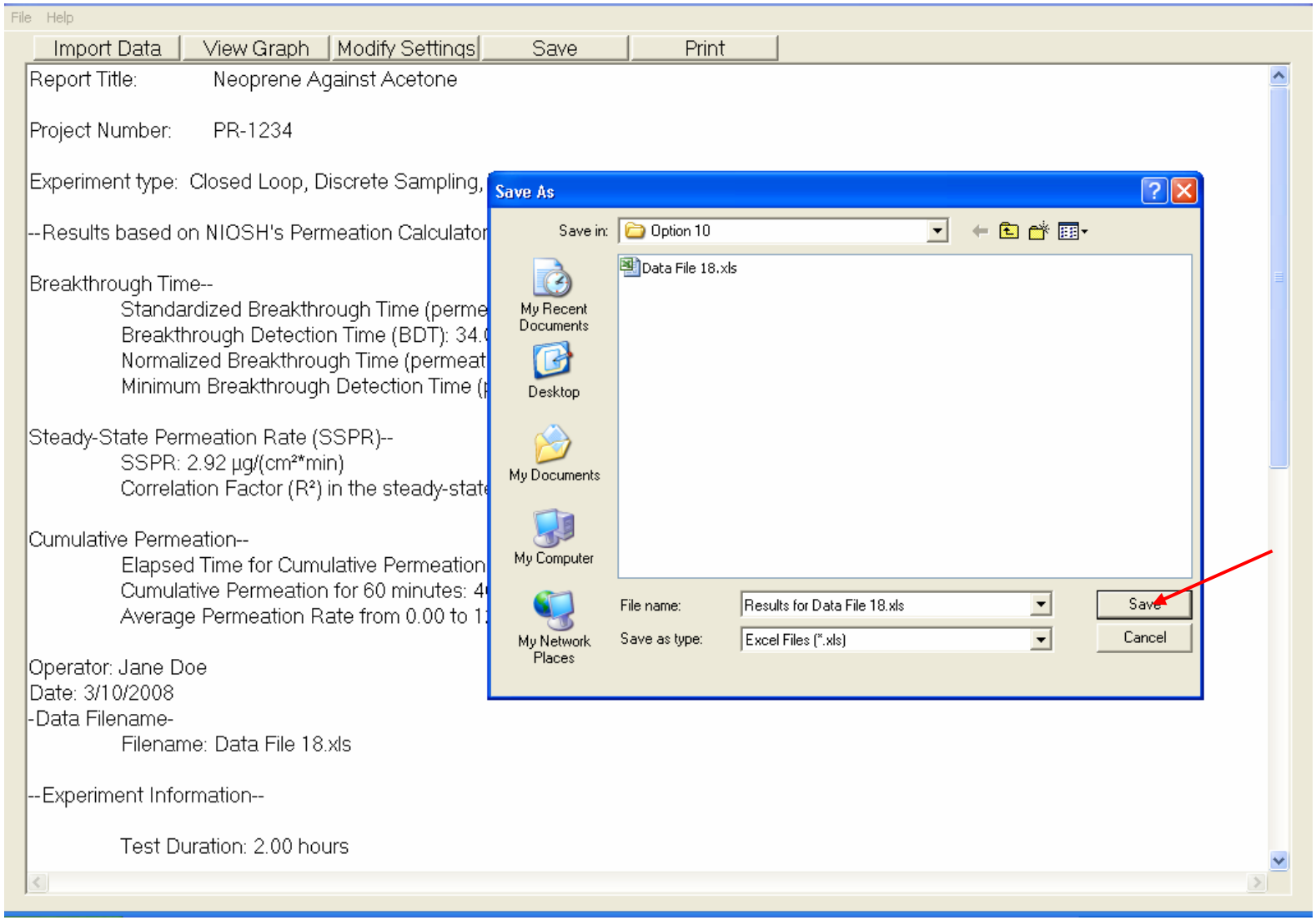
File Help
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View Graph
Modify Settings
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Report Title: Neoprene Against Acetone
Project Number: PR-1234
Experiment type: Closed Loop, Discrete Sampling,
--Results based on NIOSH's Permeation Calculator
Breakthrough Time--
Standardized Breakthrough Time (perme
Breakthrough Detection Time (BDT): 34.
Normalized Breakthrough Time (permeat
Minimum Breakthrough Detection Time (
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R²) in the steady-state
Cumulative Permeation--
Elapsed Time for Cumulative Permeation
Cumulative Permeation for 60 minutes: 4
Average Permeation Rate from 0.00 to 1
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours
Save As
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Data File 18.xls
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Desktop
My Documents
My Computer
My Network Places
File name: Results for Data File 18.xls
Save as type: Excel Files (*.xls)
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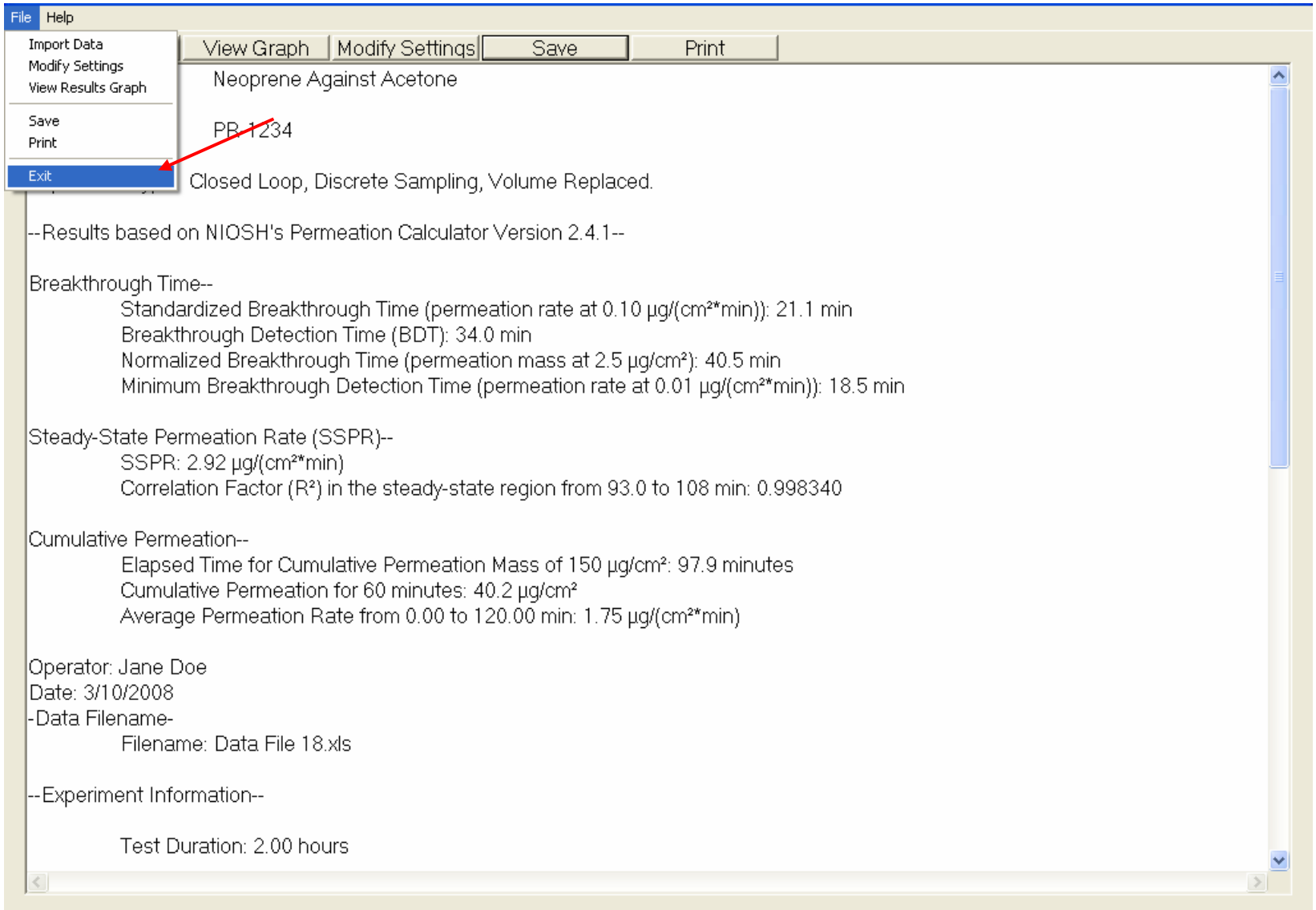
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Import Data
Modify Settings
View Results Graph
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View Graph
Modify Settings
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Neoprene Against Acetone
PR-1234
Closed Loop, Discrete Sampling, Volume Replaced.
--Results based on NIOSH's Permeation Calculator Version 2.4.1--
Breakthrough Time--
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Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)): 18.5 min
Steady-State Permeation Rate (SSPR)--
SSPR: 2.92 µg/(cm²*min)
Correlation Factor (R²) in the steady-state region from 93.0 to 108 min: 0.998340
Cumulative Permeation--
Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 97.9 minutes
Cumulative Permeation for 60 minutes: 40.2 µg/cm²
Average Permeation Rate from 0.00 to 120.00 min: 1.75 µg/(cm²*min)
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 18.xls
--Experiment Information--
Test Duration: 2.00 hours

Microsoft Excel - Results for Data File 18.xls

File Edit View Insert Format Tools Data Window Help

F21

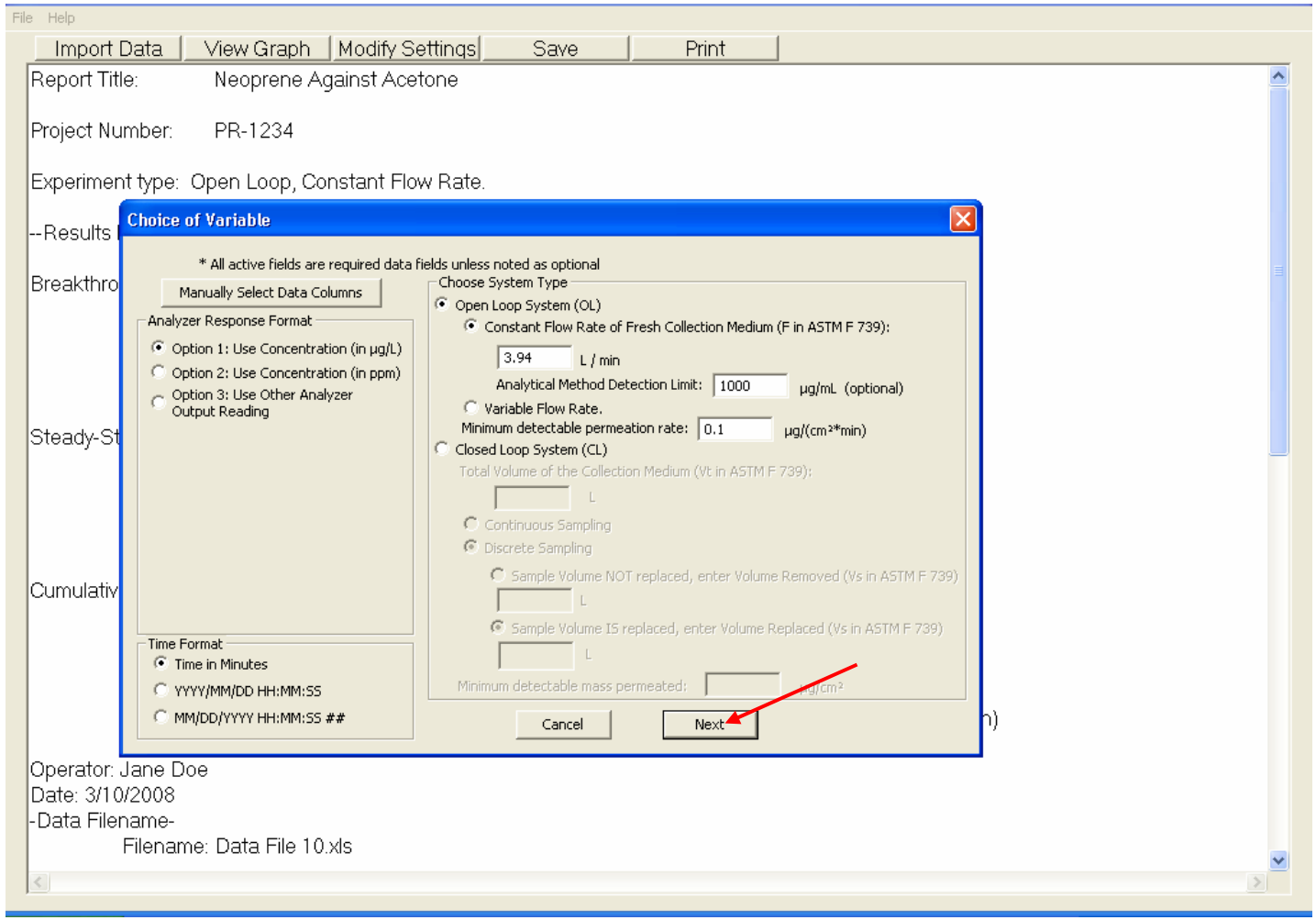
	A	B	C	D	E	F
1	Report Title:	Neoprene Against Acetone	Results based on NIOSH Permeation Calculator	--	Version 2-4-1	
2						
3	Operator:	Jane Doe				
4	Date:	3/10/2008				
5	Data Filename:	Data File 18.xls				
6	Project Number:	PR-1234				
7			Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)):	21.1	min	
8			Breakthrough Detection Time (BDT):	34	min	
9			Normalized Breakthrough Time (permeation mass at 2.5 µg/cm²):	40.5	min	
10			Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)):	18.5	min	
11			Steady-State Permeation Rate (SSPR):	2.92	µg/(cm²*min)	
12			Correlation Factor (R^2) in the Steady-State Region:	0.99834		
13			Start Time in the Steady-State Region:	93	min	
14			End Time in the Steady-State Region:	108	min	
15			Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²:	97.9	minutes	
16			Cumulative Permeation for 60 minutes:	40.2	µg/cm²	
17			Average Permeation Rate from 0.00 to 120.00 minutes:	1.75	µg/(cm²*min)	
18						
19						
20	Experiment Information					
21			Test Duration:	2	hours	
22		Material	Manufacturer & Product:	Neoprene		
23			Average Thickness:	0.685	mm	
24			Exposure Area:	5.07	cm²	
25			Weight Per Unit Area of Specimen:	1970	g/m²	
26		Test Chemical	Physical State:	Liquid		
27			Test Chemical:	Acetone, 99.5% min		
28			CAS #:	67-64-1		
29			Manufacturer:	FisherChemicals		
30			Lot/Batch #:	034404		
31			Expiration Date:	May 30, 2010		
32		Temperature	Nominal Test:	23.5 degrees Celsius		
33			Range:	22.1 to 23.2 degrees Celsius		
34		Analytical Technique	Instrument Type:	Miran IR		
35			Instrument ID Number:	CDC 1236		
36			Instrument Settings:	Wavelength 8.5 µm, Pathlength 20.25		
37			Sampling Pump ID:	Wr-156p		
38		Collection System	Medium:	Air		
39			Total Volume of the Collection Medium (Vt):	5.64	L	
40		System Type:	Closed Loop, Discrete Sampling, Volume Replaced.			
41			Volume of Discrete Sample (Vs) Removed from Collection Medium:	0.05	L	
42			Data Sampling Interval (seconds):	3		

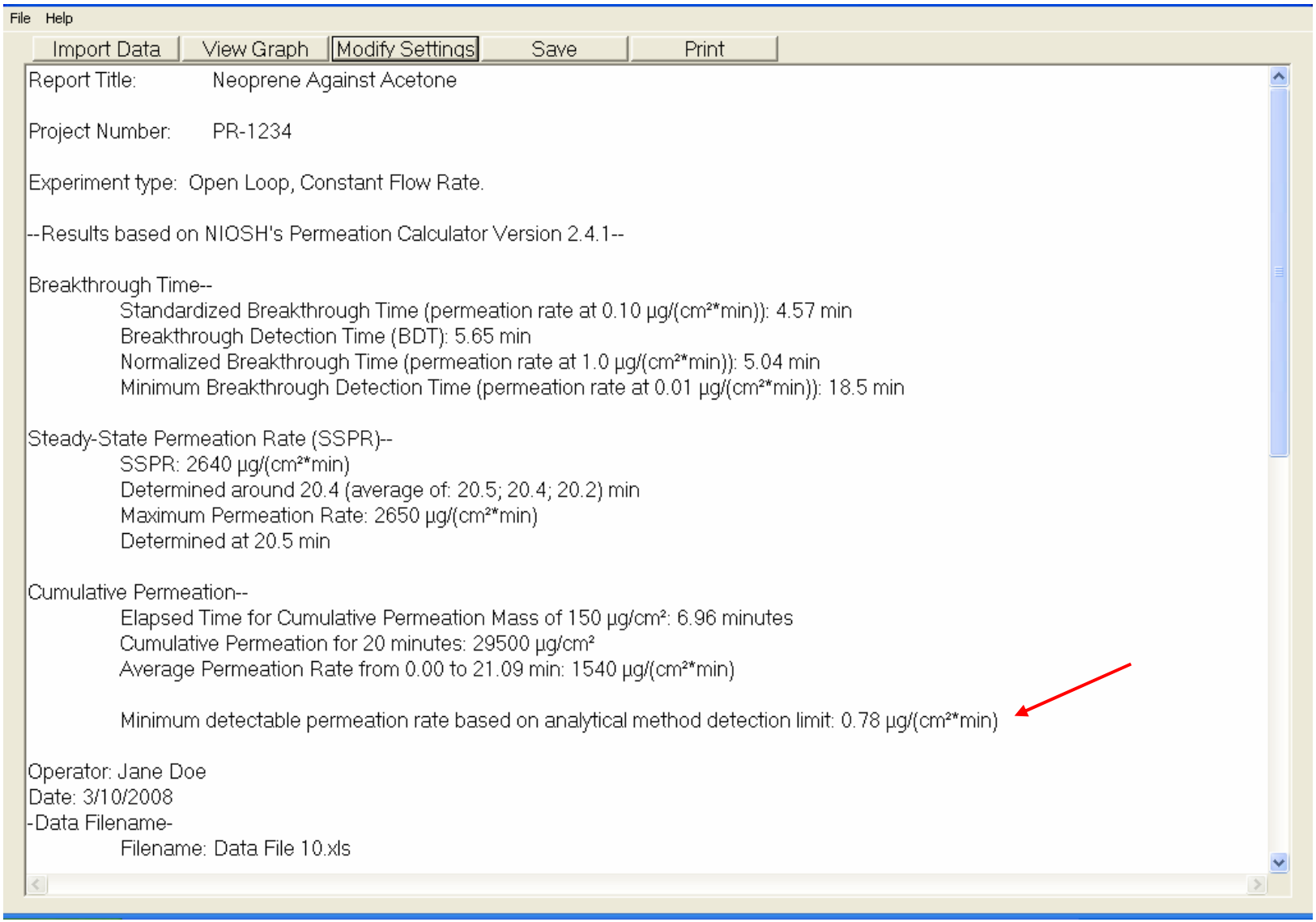
Results

Ready NUM

The permeation curve can be copied into the Excel file formatted report by selecting “View Graph” and pressing “Ctrl/Print Scrn”, then pasting the image into the report.

For open loop testing under a constant flow rate, there is an option to enter a value for the “Analytical Method Detection Limit” to calculate the “Minimum Detectable Permeation Rate” (see the report on the next slide).




File Help
Import Data
View Graph
Modify Settings
Save
Print
Report Title: Neoprene Against Acetone
Project Number: PR-1234
Experiment type: Open Loop, Constant Flow Rate.
--Results based on NIOSH's Permeation Calculator Version 2.4.1--
Breakthrough Time--
Standardized Breakthrough Time (permeation rate at 0.10 µg/(cm²*min)): 4.57 min
Breakthrough Detection Time (BDT): 5.65 min
Normalized Breakthrough Time (permeation rate at 1.0 µg/(cm²*min)): 5.04 min
Minimum Breakthrough Detection Time (permeation rate at 0.01 µg/(cm²*min)): 18.5 min
Steady-State Permeation Rate (SSPR)--
SSPR: 2640 µg/(cm²*min)
Determined around 20.4 (average of: 20.5; 20.4; 20.2) min
Maximum Permeation Rate: 2650 µg/(cm²*min)
Determined at 20.5 min
Cumulative Permeation--
Elapsed Time for Cumulative Permeation Mass of 150 µg/cm²: 6.96 minutes
Cumulative Permeation for 20 minutes: 29500 µg/cm²
Average Permeation Rate from 0.00 to 21.09 min: 1540 µg/(cm²*min)
Minimum detectable permeation rate based on analytical method detection limit: 0.78 µg/(cm²*min)
Operator: Jane Doe
Date: 3/10/2008
-Data Filename-
Filename: Data File 10.xls