

SYLLABUS

AutoChem II 2920 Operator Training

INSTRUCTIONAL GOALS

This course introduces students to the components, operation, and theory of the AutoChem II for surface area and porosity analysis.

At the end of this course, you will:

- Be able to identify and power up the system, including installation of the operating program.
- Be able to properly weigh the sample tube with and without sample, determine sample amount required and properly load a sample into the Instrument.
- Understand the basic fundamentals of chemisorption and the basic operation of a dynamic (flowing gas) analysis system.
- Be able to use the computer and operational software to perform an analysis on a reference material.
- Be able to properly configure a report format, overlay sample data, and obtain analysis information according to your laboratory requirements.
- Be able to make all user level repairs, adjustments and checks, and locate equipment problems using the Troubleshooting section of the Operator's manual.

NEEDS AND RESOURCES

Required Background

To successfully complete this course, you must:

- Have some minimal exposure to an AutoChem II in a laboratory environment.
- Have reviewed the Operator's manual.

Required Materials

The following provided materials will help you successfully complete this course:

- Laboratory Practical Exercise Guide with Lecture Presentations
- Notepad, Pen and Highlighter
- Micromeritics Thumb Drive

Additional Print Resources

The following publications will also be provided:

- Webb, Paul A. and Clyde Orr. *Analytical Methods in Fine Particle Technology*. Norcross, Georgia, U.S.A.: Micromeritics Instrument Corporation, 1997.
- Related Application Notes and Technical Tips.

Online Resources

Additional information can be found at:

- www.micromeritics.com

COURSE SCHEDULE

Day 1

Session	Room	Activity	Approximate Time
-	LECTURE	Introduction	8:00 AM to 8:15 AM
1	SERVICE	System set-up and overview. Performing a loop calibration. Performing a TCD calibration	8:15 AM to 10:00 AM
2	LECTURE	AutoChem II Theory of Operation	10:15 AM to 11:30 AM
-	-	LUNCH	11:45 AM to 1:00 PM
3	LAB	Preparation and loading of Copper Oxide sample for analysis by hydrogen TPR. Preparation of the cold trap/initiation of Copper Oxide TPR.	1:00 PM to 2:00 PM
4	LECTURE	Pulse and Static Chemisorption	2:00 PM to 3:30 PM
5	LAB	Gas defaults and calculating true MFC constants. The programming and use of parameter files. Preparation loading and initiation of platinum on alumina for analysis by carbon monoxide pulse chemisorption.	3:30 PM to 4:30 PM

Day 2

Session	Room	Activity	Approximate Time
-	LECTURE	Day 2 Introduction and Brief Questions/Review of Day 1	8:00 AM to 8:15 AM
1	LAB	Preparation loading and initiation of ZSM-5 sample for analysis by ammonia TPD. A review of the Options Menu	8:15 AM to 9:30 AM
2	LECTURE	Temperature Programmed Experiments	9:30 AM to 11:30 AM
-	-	LUNCH	11:45 AM to 1:00 PM
3	-	FACILITY TOUR	1:15 PM to 2:15 PM
4	LECTURE	Heat of Desorption	2:30 PM to 4:30 PM

Day 3

Session	Room	Activity	Approximate Time
-	LECTURE	Day 3 Introduction and Brief Questions/Review of Day 1	8:00 AM to 8:15 AM
1	LAB	Preparation loading and initiation of ZSM-5 sample for analysis by isopropylamine vapor pulse chemisorption and TPD	8:15 AM to 9:00 AM
2	LECTURE	Vapor Analyses	9:00 AM to 10:00 AM
	LECTURE	Peak Editing and Class Generated Results	10:00 AM to 11:30 AM
-	-	LUNCH	11:45 AM to 1:00 PM
3	LECTURE	A review of Report Options, Data Reduction	1:15 PM to 2:15 PM
5	SERVICE	A discussion of operator maintenance	2:15 PM to 3:15 PM

POLICIES AND PROCEDURES

General Rules:

Attendance to all scheduled lectures and labs is very important due to the length of the course. Please make every attempt possible to avoid tardiness. If you do come in late, please enter through the rear door of the classroom (accessible from the laboratory) so as to not disrupt or distract your fellow students. If you are unable to attend a day or part of a day due to emergency, please notify the MLC Training Coordinator immediately.

Remember, you and/or your company have a business need for you to attend and complete this course to insure that you are getting the most out of your/your company's investment in your Micromeritics instrument.

Grading Policies:

You will be periodically evaluated throughout the course during oral discussions and demonstrations. There are also questions in your Operator Training Study Guide that will be discussed at the completion of each unit. Please be prepared to answer questions about the previous lessons content. A brief assessment exam will be given at the end of the course to verify that learning objectives are met by each student.

Grading Scale:

There is no grading scale for this course and you will not fail. Again, you and/or your company have a business need for you to attend and complete this course to insure that you are getting the most out of your/your company's investment in your Micromeritics instrument .

ADDITIONAL INFORMATION

Lunch will be provided by Micromeritics. Please inform the MLC Training Coordinator of any special dietary needs.

CONTACT INFORMATION

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