

CHEM 3702 Special Topics, Analytical Mass Spectrometry; Principles and Applications Fall 2004

Instructor Dr. Verl Murugaverl

Objectives:

This course objective is to make you familiar with modern mass spectrometry and its applications to a wide range of studies. This course will provide an advanced training in both theoretical and practical aspects of MS to those who are planning on using state-of-the-art mass spectrometers. The topics include ionization techniques, mass analyzers, fragmentation, tandem mass spectrometry, and more specific areas like proteomics, post-translational modifications and principles of coupling of separation techniques with MS.

Experiments will be carried out to demonstrate the utility of MALDI/TOF, ESI/ITMS in macromolecular analysis and the use of LC and GC coupled with MS.

Prerequisites:

Sound knowledge of organic chemistry will be very helpful. You will be responsible for searching the literature on the topics covered (in the lectures) for additional (in depth) information.

Evaluation:

Your comprehension of the material covered will be evaluated by three 30 minutes quizzes and your experimental skills.

The participants will be working in groups on various problems including developing strategies to solve analytical problems and executing the experiments. Each student is expected to present a short report on their investigations at the end of the course.

Literature:

Any texts on Mass Spectrometry and its applications.

Review Articles

Scientific Publications

Useful web sites:

www.ms.mc.vanderbilt.edu/tutorials/ms

www.methods.ch.cam.ac.uk/meth/ms

Environmental Chemistry 1: Atmospheric Chemistry

Don Stedman 303 871-2580 Home 303 757-2489 and talk to the machine

Problem sets may be done as collaboratively as you wish, but each student must turn one in.

Late problem sets lose 25% of their value per day late

Office Hours any noon hour: SGM 101 or by appointment

Sept			
13	Composition of the atmosphere and combustion stoichiometry		
15	equilibrium products of combustion		
17	coal, gasoline and diesel		
20	Kinetics and departure from equilibrium		
22	Zeldovich NO formation		
24	Atmospheric fate of NO and SO ₂	problem set 1 (stoichiometry) due	
27	Air pollution general		
29	London		
1-Oct	Los Angeles and Denver	discuss Holzworth	
		If I can find it	
4	NO ₂ photochemistry 1 NO _x and O _x		
6	NO ₂ photochemistry 2 VOC NMHC and HO _x		
8	Beer's law photochemistry and visibility	problem set 2 (K _p) due	
11	Regional air pollution		
13	geochemical cycles and steady state		
15	MID TERM	problem set 3 (kinetics) due	
X 18	Particle formation in the atmosphere SL		
20	Particle formation in combustion SL		
22	Particles and visibility SL		
25	Formation of atmospheric layers. Scale height		
27	ionosphere		
29	stratosphere	Particle problem set 1 due	
Nov			
1	Chapman mechanism		
3	HO _x NO _x ClO _x etc		
5	spray cans and the ozone layer		
8	Polar ozone hole		
10	control techniques laws and technologies		
12	control techniques laws and technologies	Particle problem set 2 due	
x 15	Particles and lungs SL		
x 17	Particles and climate SL		
x 19	Particles in the stratosphere SL		
22	8:00 - 10:00 am FINAL EXAM		