

Environmental Health Sciences 164/264

FATE AND TRANSPORT OF ORGANIC CHEMICALS IN THE AQUATIC ENVIRONMENT

Instructor: Dr. Mel Suffet Office: 46-081-B CHS msuffet@ucla.edu x68230

Text/Reader – Required –

Text – Environmental Organic chemistry 2nd /ed. , Schwarzenbach et al., Wiley-Interscience 2003.

Exams: Final: In class, closed book 50% of grade

NOTE: Undergraduates will do 80 % of examination questions.

Homework: To be distributed

Mid-term Report: 1) Evaluation of a Environmental Mass Transport Mechanisms 20% of grade

NOTE: Undergraduates will do a simpler topic.

2) Aquatic modeling problems 30% of grade.

NOTE: Undergraduates will do only 80% of the Aquatic modeling problems.

Term Project: Fate and Transport of an Organic Chemical: Comparison of a Computer Model vs.

Actual Environmental Data. A Student Assistant will help with the Computer modeling for the course.

NOTE: Undergraduates will do a simple topic.

Lecture Topics

I. Overview-Models and Calculations

1. Introduction - Lecture 1

A. "Normal" Element Cycles in the Environment

B. Interactions between the Air and Water Environment - Sources, Sinks and Rates

C. Pollutants - Chemical, Physical, Biological Fate

D. Water - The mover and Shaker

2. The Nature of Organic Chemicals – Lecture 2

A. Vapor Pressure

B. Solubility

C. Structure/Activity Relationship

3. Models - Equilibrium Type - "CEPAC" - Lecture 3 - 4

4. Models - Junge Box Models- Global Modeling Approach in Air - Lecture 5

5. Models – Fugacity Multimedia Models - Lecture 6 - 7

II. Transport-Interfacial Phenomena (Lectures 7 – 12)

1. Air-Water Interfacial Phenomena (Lectures 7 - 8)

2. Water-Solid Interfacial Phenomena (Lectures 9 - 11)

3. Air-Solid Interfacial Phenomena (Lectures 12)

III. Chemical Processes (Lectures 13 – 17)

1. Hydrolysis

2. Photolysis

IV. Biological (Biochemical) Processes (Lectures 18 – 20)

1. Bioaccumulation

2. Biodegradation