

CHEM 100

Principles Of Chemistry



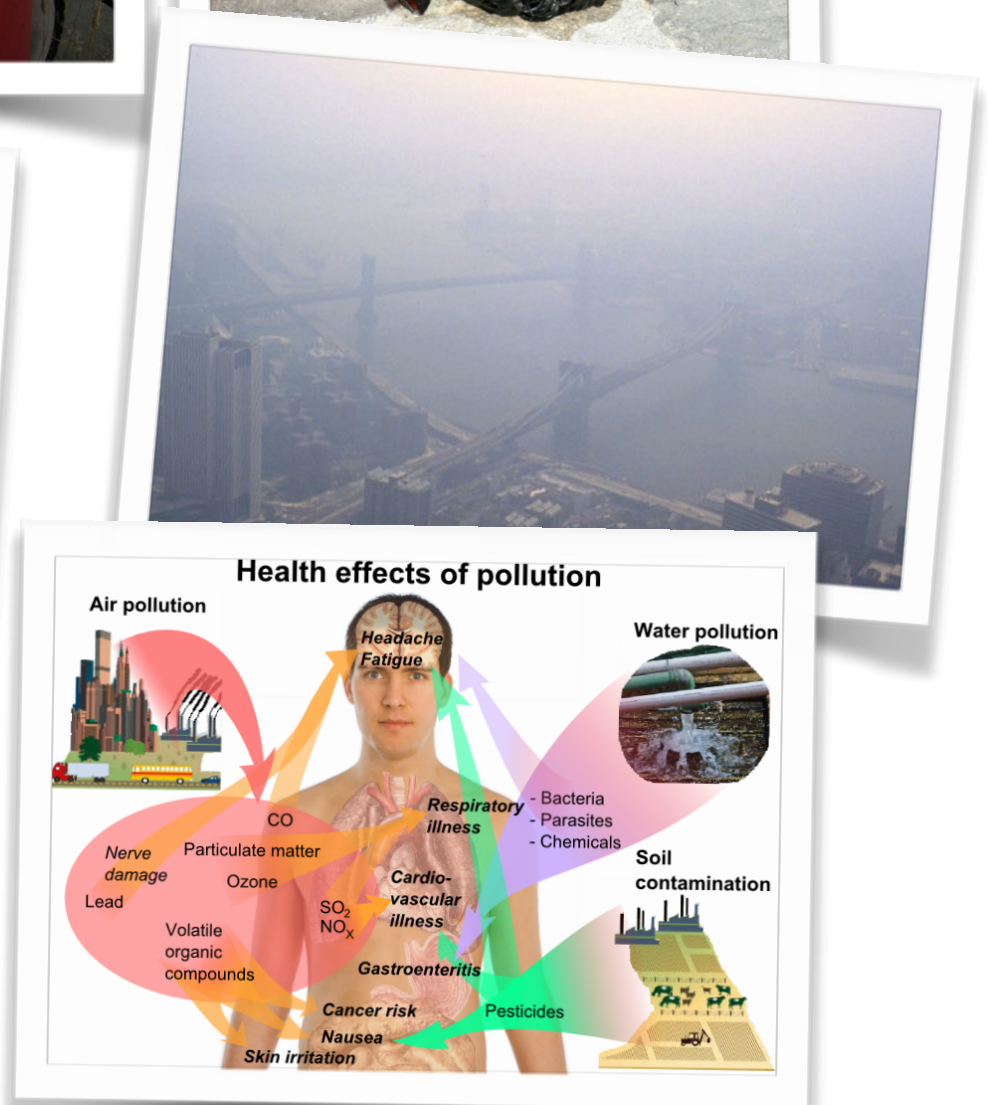
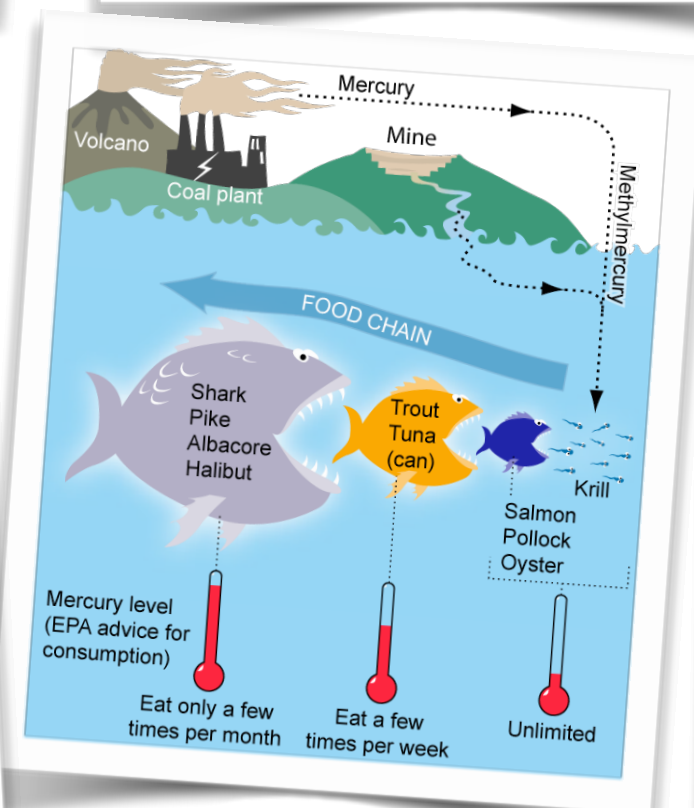
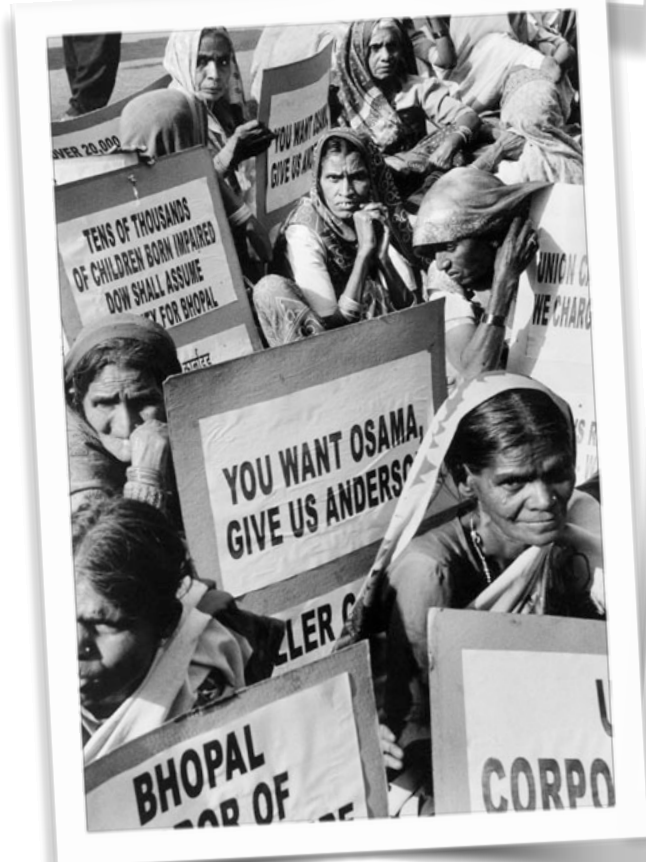
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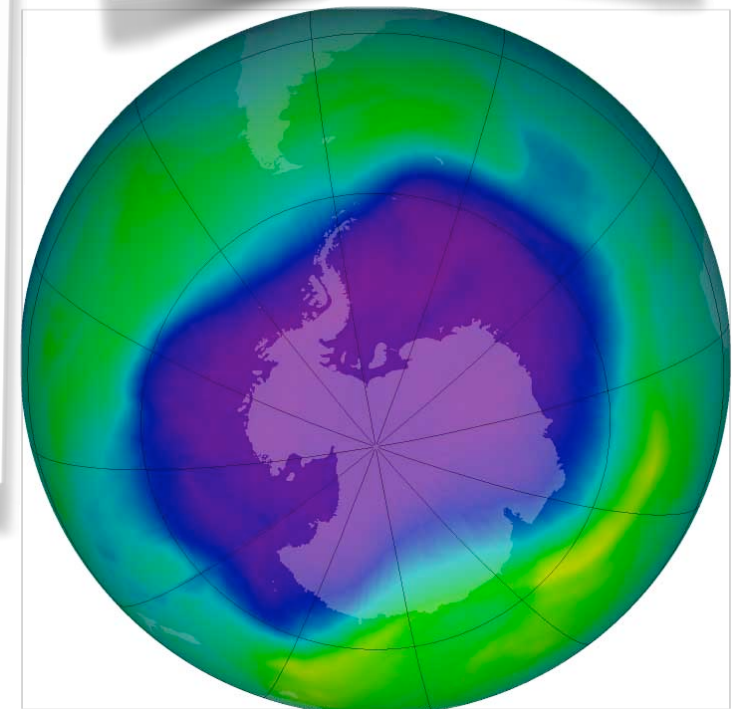
0.1 Chemistry And Public Perception



Chemistry And Public Perception

- Persistent pesticides (like DDT) create major ecological concerns
- Leaded gasoline causes mental retardation in children
- Petrochemical spills endanger wildlife
- Chemical manufacturing industries may have serious accidents (like Union Carbide plant in Bhopal, India)
- Mercury from coal burning contaminates fish
- Volatile chemicals create photochemical smog
- Pollution created by chemical releases endanger human health

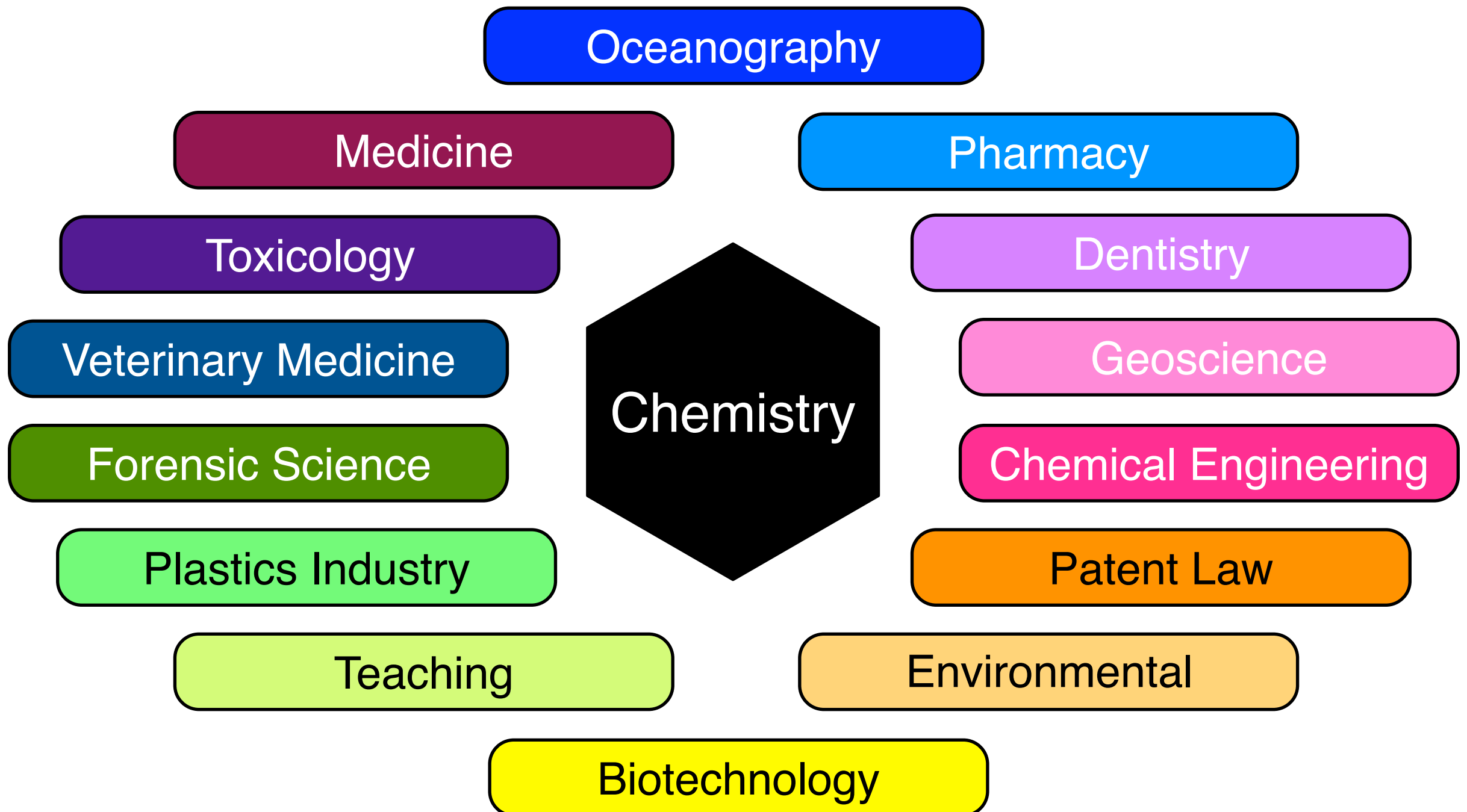
Chemistry And Public Perception



Chemistry And Public Perception

- Alchemists and artisans created metals from metal ores ~5000-3000 years ago
- The first batteries were created about 200 years ago
- Chemists created the first synthetic plastics (polymers) ~180 years ago
- Inorganic fertilizers greatly improved crop yields starting ~150 years ago
- Aspirin was synthesized ~110 years ago
- Our understanding of what destroyed atmospheric ozone occurred ~30 years ago

0.2 Why Is Chemistry So Important?



0.3 Why Is Chemistry So Difficult?

1. Memorization

- Important components must be committed to memory

2. Concepts

- Some material is not easy to understand (reading or comprehension skills) or describe (writing skills)

3. Mathematics

- Basic algebra is required to understand the full power of chemistry

4. Problem solving

- Using knowledge and reasoning to tackle problems never seen

5. Manual dexterity and observation

- Observation skills and hand-eye coordination in laboratory
- Each one takes practice and patience to acquire

0.4 What Is This Class About?

- An introduction to the ideas, methods and calculations of chemistry:
 1. Doing Science
 2. Measurements and Problem Solving
 3. Matter and Energy
 4. Atoms and Elements
 5. Molecules and Compounds
 6. Chemical Composition
 7. Writing Chemical Reactions
 8. Quantities in Chemical Reactions
 9. Solution Composition
 10. Atomic Structure

0.5 Making Your Schedule Work¹

- In order to pass this class you must develop good study habits
 1. Study at your best time of day
 2. Study difficult or less enjoyable subjects first
 3. Use one place set up for studying
 4. Avoid all distractions
 5. Use waiting time to study
 6. Form a regular weekly study group
 7. Take school seriously

¹<http://www.ucc.vt.edu/lynch/TimeManagement.htm>

0.6 Your Study Habits

- You must:
 1. Know **how to study**
 2. Have an appropriate **academic background**
 3. Know how to **read, listen** and **understand**
 4. Be **self-directed** - know how to determine which material to study
 5. Be **self-motivated** - do you want to do well in this class?
 6. Be **self-disciplined** - continue to study until you learn the material

0.7 Your Professor's Expectations

- Your professor expects you to perform well in this class and you will if you:
 1. Come to every class, actively participate and pay attention
 2. Make good lecture notes
 3. Spend at least as twice as much time studying outside class as in class
 - Study 3-5 times a week on regular days
 - Use the time to read and understand the text, reread lecture notes, try as many sample problems as you can find
 4. Seek help early if you have problems
 5. Be positive!

0.8 Making Good Lecture Notes

Representing Quantitative Information - Equations

Tricky - be careful

- If we do an experiment where we purposely vary the temperature, we are changing the **independent variable**
- The pressure changes in response and so is called the **dependent variable**
- We can also show this data as a graph

Keywords in bold - must know

Temperature (K)	Pressure (atm)
290	1.06
295	1.08
300	1.10
305	1.12
310	1.14

Ask prof. later!

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- Make notes on every slide!
- Listen for key terms, analogies or explanations

Ch 1 S20

08/13/13

- independent variable (i.v.) is the thing under control ✓
- dependent variable changes when the i.v. is varied ✓
- Temperature is in strange units? OK
- Pressure increases as temp. increases - this is expected for directly proportional ✓
- Prof. told a story about a can of soup exploding in a microwave oven because pressure got too big as soup got hot!
- How do I know which is i.v.? Will be told in exam question; **always on x axis on graph**