

CHEM 101 MODULE #2: WHAT SHOULD WE DO ABOUT GLOBAL WARMING?

An overview

For the Global Warming Module, we will not have you purchase the student manual. Readings will come largely from your Whitten text with some supplemental reading handouts. The chemistry we will cover in the next few weeks includes basic molecular structure, molecular polarity, and stoichiometry. We will skip around a lot in the book pulling sections from different chapters, so here is the rough order of topics to keep in mind.

Introduction: Planet Earth

Whitten Text: all of Chapter 2, Sections 3-6 and 3-7, Section 4-1, and Sections 5-8 and 5-9

- Isotopic abundance and mass spectrometry
- The composition of the earth
- Introduction to the atmosphere
- Introduction to the chemistry of the oceans
- Concentration and dilution

Session 1: Is the Climate Changing?

Conference activity 10/3-10/4

- What are the trends in global average temperature?
- Why is the temperature rising?
- What's the connection between greenhouse gases and global temperature?
- What are other effects of climate change?

Session 2: The Global Carbon Cycle

- How is carbon distributed globally?
- What are the sources and sinks of CO₂?

Session 3: What determines whether a gas is a greenhouse gas?

Whitten Text: Chapter 6, Section 6-6, Chapter 7, Sections 7-1 thru 7-6 and 7-10 thru 7-12, and Chapter 8, Sections 8-1 thru 8-3 and 8-5 thru 8-9 (Parts A and B only)

- How are the atoms in greenhouse gases connected?
- Lewis structures of atmospheric molecules
- What are the shapes of the greenhouse gas molecules?
- VSEPR theory: predicting molecular shape and polarity
- What determines whether a gas absorbs infrared radiation?

Session 4: Venus is too hot, Mars is too cold, but Earth is just right: The Greenhouse Effect

Handout on The Greenhouse Effect, Whitten pg. 402, 403

Session 5: How much are greenhouse gas concentrations changing?

Whitten Text: Chapter 3

- What daily activities contribute to rising greenhouse gases?
- Balancing reactions, moles, and stoichiometry
- What are your personal contributions to greenhouse gas emissions?

Culminating Project: Writing Assignment

More details and expectations will be provided later.

- Assignment on Friday, 12 October, 2007
- Project due on Monday, 29 October, 2007