

CHEM 160 Chemistry and Materials, 2004, Quarter 2

Instructor

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Office hours: See timetable on office door or on web site, <http://ccins.camosun.bc.ca/~humphreb>

Text

Fine, Beall & Stuehr, 2000. **Chemistry for Scientists and Engineers**, Prelim. Edn., Saunders

Lab. Manual: On the web site; <http://ccins.camosun.bc.ca/~humphreb> and follow the links.

Timetable

Lectures: Monday 13:30-15:20, Tuesday 08:30-10:20, Tech 173

Laboratory: Friday, 12:30:14:30 Alternate weeks, in Tech 230

Intended learning outcomes:

- Use the Lewis model of the atom in conjunction with the periodic table to predict the chemical and physical properties of elements, including chemical bonding and the formation of compounds.
- Write balanced chemical equations for chemical reactions including reduction-oxidation reactions, and determine stoichiometric quantities of reactants in those reactions.
- Determine properties of pure chemicals and of mixtures of chemicals based on solid, liquid and gaseous phases, and interpret solid and liquid phase diagrams for engineering materials.
- Apply the principles of thermodynamics to determine rates of chemical reaction, chemical equilibrium, and energy changes in chemical transformations.
- Apply the principles of electrochemistry to determine corrosion potential and inhibition, and electrolytic processes.
- Apply the principles of organic chemistry to the structure and naming of organic compounds, in particular polymers, and identify properties associated with specific functional groups.

Evaluation

Grading as in 2003/2004 Camosun College Calendar, p 38

Laboratory (4)	12%
Quizzes (3)	18%
Midterm	20%
Final	50%
Total	100%

Detailed outline

Date	Day	Activity	Text chapter
1/5/2004	Monday 1:30	Matter, atoms, molecules, Lewis structures	1, 2, 6.1, 6.2, 6.5, 6.6, 6.7
1/6/2004	Tuesday 8:30	Periodic Table, Ionic and covalent bonding	2, 8.1, 8.2
1/9/2004	Friday 12:30	Lab safety EVERYONE ATTENDS	
1/12/2004	Monday 1:30	Polar bonds, molecular shape, polar molecules	7.1, 7.2, 7.3
1/13/2004	Tuesday 8:30	Chemical reactions, mole, stoichiometry	3
1/16/2004	Friday 12:30	Group 1 <i>Lab 1</i> Stoichiometry	
1/19/2004	Monday 1:30	Quiz 1; Gases, liquids, solids	4
1/20/2004	Tuesday 8:30	Mixtures, solutions	9.1, 9.3, 9.4
1/23/2004	Friday 12:30	Group 2 <i>Lab 1</i> Stoichiometry	
1/26/2004	Monday 1:30	States of matter, phase changes	9.2, 9.6
1/27/2004	Tuesday 8:30	Phase changes	9.5
1/30/2004	Friday 12:30	Group 1 <i>Lab 2</i> Distillation Full report required	
2/2/2004	Monday 1:30	Midterm	
2/3/2004	Tuesday 8:30	Thermochemistry, thermodynamics, ΔH , ΔS , ΔG	12, 13
2/6/2004	Friday 12:30	Group 2 <i>Lab 2</i> Distillation Full report required	
2/9/2004	Monday 1:30	Rates of reaction, equilibrium	15.1, 15.2, 15.8
2/10/2004	Tuesday 8:30	Aqueous equilibrium	10
2/13/2004	Friday 12:30	Reading Break College closed	
2/16/2004	Monday 1:30	Oxidation/reduction, Electrochemistry	14.1, 14.2, 14.3
2/17/2004	Tuesday 8:30	Corrosion	14.5
2/20/2004	Friday 12:30	Group 1 <i>Lab 3</i> Heat of combustion	
2/23/2004	Monday 1:30	Quiz 2; Metals	16.3, 17.4
2/24/2004	Tuesday 8:30	Organic chemistry, nomenclature	21
2/27/2004	Friday 12:30	Group 2 <i>Lab 3</i> Heat of combustion	
3/1/2004	Monday 1:30	Organic chemistry, functional groups	21
3/2/2004	Tuesday 8:30	Organic chemistry, functional groups, reactions	21
3/5/2004	Friday 12:30	Group 1 <i>Lab 4</i> Aspirin	
3/8/2004	Monday 1:30	Quiz 3; Organic reactions; polymers	21
3/9/2004	Tuesday 8:30	Polymers	18
3/12/2004	Friday 12:30	Group 2 <i>Lab 4</i> Aspirin	
3/15/2004	Monday 1:30	Polymers, composites	17.6
3/16/2004	Tuesday 8:30	Composites, ceramics	17.5
3/19/2004	Friday 12:30	Review	
3/22-26/2004		Exam Period	