Ms. S. Hackett2023-2024

**Chemistry 122**

**Course Outline - Prioritized Curriculum**

**Overview**

This course is designed to build on the concepts covered in Grade11 chemistry as well as address topics not yet investigated. There are four major units of study: thermochemistry, kinetics and equilibrium, acids and bases, and organic chemistry. It is anticipated that by the end of the semester, a solid foundation has been laid of introductory chemistry for further study at a post-secondary level.

**Instructional Planning**

**Thermochemistry**

*Introduction, enthalpy, bonding, Hess’s Law, entropy and Gibbs Free energy with spontaneity*

**From Solutions to Kinetics to Equilibrium**

*Kinetics and rate of reaction, collision theory, reaction mechanisms, catalysts, rate laws and reaction progression, determine rate laws from experimental data, identify reaction order, calculate Ksp and predict precipitate, relationship between Le Chatelier and biological systems*

**Organic Chemistry**

*Nature of compounds, social implications, classification, naming and writing compounds, isomers, functional groups, applications, writing and balancing equations, polymerization, experimentation, risks and benefits on society, combustion*

**\*Time dependent - Acids and Bases**)\*

*Properties and definitions, acid/base reactions, OH, H3O+, Le Chatelier, using the equilibrium concept with acids and bases, titrations, Lewis acids and bases, buffers*

**Evaluation\***

Thermochemistry 20%

Kinetics & Chemical Equilibrium 20%

Organic Chemistry 15%

Acids and Bases (time dependent) 15%

Final Assessment 30%

Extra help will available as needed – mornings, lunch time or after school

If a student fails a summative assessment, they can apply for an opportunity for a redo to obtain a replacement mark of maximum 65%. The student must apply with a request to redo form, if approved they must attend a help session on section(s) they struggled with on the assessment, and it must be completed within 2 weeks of original assessment.

**Note**:  If you miss 7 days or fewer in all classes, have completed all the requirements for the course, and have a passing grade, you can choose to take 15%, 30% or 50% on your Cumulative Demonstration of Learning.  *Three tardies (3 lates) counts as one absence.*

**Chemistry 122 Formula Sheet**

**Chapter 17 – Thermochemistry**

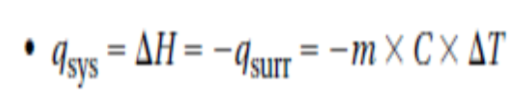
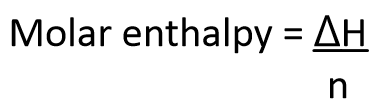
4.184J = 1 cal 1 Calorie = 1 kilocalorie = 1000 calories

Specific heat capacity of ice = 2.10 J/(g∙◦C)

Specific heat of water = 4.18 J/(g∙◦C)

Specific heat capacity of steam = 1.70 J/(g∙◦C)

C = q/m∙∆T

Water = ∆Hfus = 6.01kJ/mol; ∆Hsolid = -6.01kJ/mol or (334 J/g)

∆Hvap = 40.7 kJ/mol; Hcond = -40.7kJ/mol or (2260 J/g)

∆H0 = ∆Hf0 (products) - ∆Hf0 (reactants)

**Chapter 18 – Rates of Reaction**

= [C]c [D]d  
 [A]a[B]b

Ksp = [cation]c[anion]d whichis basically Ksp = [C]c [D]d

∆G = ∆H - T∆S

Rate = k[A]a[B]b

**Chapter 19 – Acid Base Chemistry**

Kw = [H+][OH-] = 1.0 x 10-14  pH + pOH = 14

pH = -log[H+] pOH = -log[OH-]

Ka = [H+][A-] /[HA] Ka = [H+] [ anion] Kb = [cation] [OH-]

[acid] [base]

List all known's, show all formulas, put values into the formulas with units and put final statements where required.

All calculation goes to one extra digit until final answer use correct amount of significant Digits.