Secondary V Chemistry Resources

Prepared by Dawson College and John Abbott College

Your college chemistry teachers recognize the challenges you have and will continue to face during the pandemic period. To support you in your preparation for the Fall semester, we have compiled this list of resources. The resources include video tutorials, interactive exercises, simulators and other materials.

Please focus your review efforts on the chemistry that you found the most challenging during the self-evaluation. Note that the self-evaluation included many topics from high school including content from Secondary IV. Some of these topics will be reviewed this Fall, others will be seen again during your second chemistry course. These resources will be permanently available so you can come back to them at any time.

A reminder that we will send out a subsequent email with a second version of this self-evaluation. This will provide you with a chance to test yourself again to see if you have improved your understanding. We are confident you will have!

Atomic Structure

Atoms and Ions

- Interactive tutorial and problem set
  - Atomic Structure (login as a guest)
    https://simbucket.com/chemthinkserver/chemthink/index.html?as
  - Ions (login as a guest)
    https://simbucket.com/chemthinkserver/chemthink/index.html?io

Chemical Bonding

Covalent and Ionic bonds

- Interactive tutorial and problem set
  - Covalent Bonds (login as guest)
    https://simbucket.com/chemthinkserver/chemthink/index.html?cb
  - Ionic Bonds (login as guest)
    https://simbucket.com/chemthinkserver/chemthink/index.html?ib

Chemical Equilibrium

Le Châtelier's Principle

- Video tutorial
  - FuseSchool - Le Châtelier's Principle Part 1
    https://youtu.be/7zuUV455zFs
  - FuseSchool - Le Châtelier's Principle Part 2
    https://www.youtube.com/watch?v=XhQ02egUs5Y&feature=youtu.be
- Exercises
  - Le Châtelier's Principle 1
    https://www.khanacademy.org/science/chemistry/chemical-equilibrium/factors-that-affect-chemical-equilibrium/e/using-le-chatelier-s-principle-exercise
  - Le Châtelier's Principle 2
    https://www.sciencegeek.net/Chemistry/taters/Unit5LeChatelier.htm

Chemical Kinetics

Energy Diagrams

- Video tutorial
  - Energy Diagrams and Catalysts' (watch until 2:56)
    https://youtu.be/fEXq_RvnYgI
  - The Reaction Path (watch until 2:33)
    https://youtu.be/0LjOXV4b-nk
  - Catalysts (watch until 2:42)
    https://youtu.be/KYD5LNVWne8
  - Energy Diagrams
    https://youtu.be/48sLH9P8QK0
- Exercises
  - Energy Diagrams 1
    http://www.sciencegeek.net/Chemistry/taters/Unit5EnergyDiagram.htm
  - Energy Diagrams 2 (omit any questions that involves temperature (e.g. 'feel hot or feel cold'))
    https://www.sciencegeek.net/Chemistry/taters/Unit5Thermochemistry2.htm

Ideal Gas Law

$PV = nRT$

- Video tutorial
  - How to Use the Ideal Gas Law
    https://www.youtube.com/watch?v=WhP6zJbSxec

- Interactive tutorial and problem set
  - The Behaviour of Gases and the Collision Theory (login as guest)
    https://simbucket.com/chemthinkserver/chemthink/index.html?gl

- Exercises
  - Ideal Gas Law
    https://www.sciencegeek.net/Chemistry/taters/Unit7IdealGasLaw.htm

Molarity

Molarity and Dissociation of Ionic Compounds

- Video tutorial
  - Molarity and Dilution
    https://youtu.be/QYK3Aj-IUIs
  - Ion Concentration
    https://youtu.be/7fHA17DOrBg
- Interactive tutorial
  - Solutions, Concentrations and Solution Stoichiometry
    https://www2.chem.wisc.edu/deptfiles/genchem/netorial/rottosen/tutorial/modules/stoichiometry/module5_5/5_5_1.htm
- Exercises
  - Molarity and Dilutions 1
    https://www.chemteam.info/Solutions/Dilution-probs1-to-10.html

    Molarity and Dilutions 2 (only do problems #11 to #15)
    https://www.chemteam.info/Solutions/Dilution-probs11-to-25.html

Moles

Mass, Moles, and Molecules

- Video tutorial
  - Mole to Particle Conversions
    https://youtu.be/OjstzjyGs_M
  - Mole to Mass Conversions
    https://youtu.be/Jfg_sKZRHjk
- Exercises
  - Moles and Mass
    https://www.sciencegeek.net/Chemistry/taters/Unit4MoleConversion.htm
  - Moles, Molecules and Mass
    https://www.saddleback.edu/faculty/jzoval/worksheets_tutorials/ch3worksheets/ws_moles_molecules_grams_02_05_09.pdf

- Quiz
  - Moles and Mass
  - https://www.sciencegeek.net/Chemistry/Quizzes/GramsMoles/

Stoichiometry

Part A - Standard Stoichiometry

- Video tutorial
  - Introduction to Stoichiometry
    https://youtu.be/BbkrNfly_Lg
  - Basic Knowledge in Stoichiometry
    https://youtu.be/AGjp9HkvT6w
- Interactive tutorial
  - Standard Stoichiometry
    https://www2.chem.wisc.edu/deptfiles/genchem/netorial/rottosen/tutorial/modules/stoichiometry/module5_1/5_1_1.htm
- Exercises
  - Standard Stoichiometry
    https://www.sciencegeek.net/Chemistry/Quizzes/Stoich/

Part B - Stoichiometry with Limiting Reactants

Method 1: Finding the limiting reactant by determining whether there is enough of one reactant to react completely with another reactant.

- Video tutorial
  - Stoichiometry Method 1: Introduction to Limiting Reactant
    https://youtu.be/nZOVR8EMwRU
  - Stoichiometry Method 1: Limiting Reactant Practice Problem
    https://youtu.be/N0dTXcoHI-I
- Interactive tutorial
  - Stoichiometry with Limiting Reactants Method 1
    https://www2.chem.wisc.edu/deptfiles/genchem/netorial/rottosen/tutorial/modules/stoichiometry/module5_2/5_2_1.htm
- Exercises
  - Stoichiometry with Limiting Reactants Method 1
    https://utt.instructure.com/courses/537/files/44771/download
- Quiz
  - Stoichiometry with Limiting Reactants (select 'Limiting reagents only' for types of problems)
    https://www.kentschools.net/ccarman/cp-chemistry/practice-quizzes/stoichiometry/

Method 2: Finding the limiting reactant by determining how much product is obtained when each of the reactants has been completely used.

- Video tutorial
  - Stoichiometry Method 2: Limiting reactants
    https://youtu.be/LicEaaXhlEY

- Tutorial and Exercises
  - Stoichiometry Method 2: Limiting Reactants (omit problems 3 and 4)
    https://www.chemistrysteps.com/limiting-reactant/

- Quiz
  - Stoichiometry with Limiting Reactants (select 'Limiting reagents only' for types of problems)
    https://www.kentschools.net/ccarman/cp-chemistry/practice-quizzes/stoichiometry/

States of Matter

Phase Change

- Video tutorial
  - Veritassium – States of Matter
    https://youtu.be/KCL8zqjXbME
  - FuseSchool - Matter and the Changes of State
    https://youtu.be/xYU7RSoOZ0U

- Simulation
  - Watch what happens at the molecular level when ice is heated to the boiling point
    https://simbucket.com/meltingandboiling/

Thermochemistry

Hess's Law

- Video tutorial
  - Hess's Law
    https://youtu.be/iETCSFit-zA

- Tutorial and exercises
  - Hess's Law
    https://opentextbc.ca/introductorychemistry/chapter/hesss-law-2/

- Exercises
  - Hess's Law 1 (Omit examples #4, 7, 9 and 10)
    https://www.chemteam.info/Thermochem/HessLawIntro1.html
  - Hess's Law 2 (treat q as ΔH)
    https://www.sciencegeek.net/Activities/Hesslaw.html