

Summer Mini-Session 2:

Atoms and the Periodic Table

Reading Assignments

Modern Chemistry (2006), Chpt. 1 (Sect. 3), Chpt. 3, Chpt. 5

Homework/Activities

- Worksheets: Isotopes and Ions
- Sect. Review (Chpt. 3, Sect. 2) (p.76) #3, 5
- Sect. Review (Chpt. 3, Sect. 3) (p.87) #2, 3
- Chapter Review (Chpt. 3) #5-12, 19, 25, 27
- Sect. Review (Chpt. 1, Sect. 3) (p.20) #1-4
- Sect. Review (Chpt. 5, Sect. 1) (p.137) #1, 3, 5
- Sect. Review (Chpt. 5, Sect. 2) (p.149) #1, 2, 6
- Chapter Review (Chpt. 5) #1, 5, 11, 22-23, 28-29, 32-34, 36, 38, 40, 44-45, 47-48

Concepts/Topics

- Historical views on the atom: Democritus, Aristotle, Dalton [pp. 67-69]
- The electron - CRTs, Thomson, oil droplets, Millikan [pp. 72-73]
- The nucleus, protons - gold foil, Rutherford [pp. 74-76]
- The neutron - Chadwick
- Atomic #, mass #, calculating the numbers of subatomic particles [pp. 77-82]
- Change in number of subatomic particles: ions, diff. elements, isotopes
- Isotopes: two notations [p. 79]
- Isotopes: calculating weighted average mass [pp. 81-82]
- Families (groups), periods; metals, nonmetals, metalloids [pp. 16-20]
- Modern Periodic Table; Mendeleev, Mosely; Periodic Law [pp. 133-136]
- Periods and Blocks in the Periodic Table [pp. 138-141]
- s-Block elements: alkali metals, alkali earth metals [pp. 142-143]
- p-Block elements: halogens, noble gases [pp. 146-147]
- main-group elements/representative elements (with s-block)
- d-Block elements: transition elements [p. 144]
- f-Block elements: inner transition metals [pp. 148-149]
- Trends: atomic radius, ionization energy, electronegativity [pp. 150-164]

Web Resources

How do I find the number of protons, electrons, ...?	education.jlab.org/qa/pen_number.html
Protons, Neutrons, and Electrons (quiz yourself!)	science.widener.edu/svb/tutorial/protonscsn7.html
Isotope - Wikipedia	en.wikipedia.org/wiki/Isotope
Early Views of the Atom	www.visionlearning.com/library/module_viewer.php?mid=50
Atomic Structure	web.jjay.cuny.edu/~acarpi/NSC/3-atoms.htm
Periodic Properties of the Elements	chemistry.about.com/od/periodictableelements/a/periodictrends.htm
What are the trends of the PT?	www.chemcool.com/regents/periodictable/aim3.htm
Periodic Trends	webhost.bridgew.edu/shaefner/general/ptrends/ptrends_242.html
Periodic Table Trends	dl.clackamas.cc.or.us/ch104-06/periodic.htm
Free Rice - Chemical Symbols (basic)	www.freerice.com/frapi/category_selected/17568
Free Rice - Chemical Symbols (full list)	www.freerice.com/frapi/category_selected/17569
Periodic Table - Los Alamos	periodic.lanl.gov/default.htm
Dynamic Periodic Table	www.ptable.com
Periodic Table of Videos	www.periodicvideos.com
Periodic Table - WebElements	www.webelements.com
Periodic Table - ChemiCool	www.chemicool.com
Periodic Table - Learner's TV	www.learnerstv.com/animation/animation.php?ani=184&cat=chemistry

Isotopes and Ions Worksheet:

Electrons, Protons and Neutrons...Oh, My!!

element	symbol	# protons	# electrons	# neutrons
1. Calcium				
2. Bromine				
3. Sodium ion				
4. Oxide ion				
5. Fluoride ion				
6. Uranium-234				
7. Carbon-14				
8. Barium-135				
9. Iron-54				
10. Titanium-46				

For each of the following elements, calculate the average mass to two decimal places:

11. _____ Boron: 20% Boron-10, 80% Boron-11
12. _____ Titanium: 8.25% Titanium-46, 7.44% Titanium-47, 73.72% Titanium-48, 5.41% Titanium-49, 5.18% Titanium-50
13. _____ Magnesium: 79% Magnesium-24, 10% Magnesium-25, 11% Magnesium-26
14. _____ Carbon: 98.89% Carbon-12, 1.11% Carbon-13
15. _____ Chlorine: 75.77% Chlorine-35, 24.23% Chlorine-37