

NAME:

HONORS CHEMISTRY

SECTION:

Assignments: Chemical Bonding and IMF's

Assignment	Due Date
1. §Handout: The properties of metals	Tuesday, 2/25
2. §Watch webcast on Bond Length vs. Bond Strength and take notes	Wednesday, 2/26
3. Work on Part I of "A Tale of 4 Electrons"	
4. Work on Part I of "A Tale of 4 Electrons"	Thursday, 2/27
5. §Finish problem set if not completed in class	
6. Study for quiz on Lewis structures	Friday, 2/28
7. Work on Part I of "A Tale of 4 Electrons"	
8. *Submit Part I of "A Tale of 4 Electrons" via Google Drive	Monday, 3/2
9. Watch this video on resonance structures	Tuesday, 3/3
10. Start planning part II of "A Tale of 4 Electrons" (suggestion: plan ionic bonding)	
11. Study for quiz on drawing Lewis structures	Wednesday, 3/4
12. Work on Part II of "A Tale of 4 Electrons" (suggestion: write ionic bonding)	
13. Watch this video on bond polarity and polar molecules	Thursday, 3/5
14. Work on Part II of TO4E (suggestion: plan metallic bonding)	
15. Watch this video on hybridization	Friday, 3/6
16. Work on Part II of "A Tale of 4 Electrons" (suggestion: plan nonpolar & polar covalent bonding)	
17. Work on Part II of TO4E	Monday, 3/9
18. §Go to the online HW site and complete 10 problems of #68—submit in Google Classroom	Tuesday, 3/10
19. Work on Part II of "A Tale of 4 Electrons"	
20. Watch this video on intermolecular attractions	Wednesday, 3/11
21. Work on Part II of "A Tale of 4 Electrons"	
22. Study for quiz on VSEPR geometries	Thursday, 3/12
23. Work on Part II of "A Tale of 4 Electrons"	
24. Work on Part II of "A Tale of 4 Electrons"	Friday, 3/13
25. Submit Part II of "A Tale of 4 Electrons" via Google Drive	Monday, 3/16
26. Finish group model building minilab if not completed in class	Tuesday, 3/17
27. Plan Part III of TO4E	Wednesday, 3/18
28. *Submit Part III of "A Tale of 4 Electrons" via Google Drive	Monday, 3/23
29. *Submit Part IV of "A Tale of 4 Electrons" via Google Drive	Friday, 3/27

Dates to Remember: §may be checked or collected in class *will be checked on-line
 In class work days Friday 3/6, Tuesday 3/10, Friday 3/13 (peer editing of Part II in class)

After studying chapters 10, 14.3, and 14.5-14.6, you should be able to:

- Explain why most atoms form chemical bonds.
- Differentiate among properties of ionic, covalent, and metallic bonds.
- Compare and contrast the properties of ionic and molecular compounds.
- Classify bonds as ionic, covalent, or polar based on electronegativity differences.
- Create Lewis structures for covalent compounds containing single, double, and triple bonds, including resonance structures and exceptions to the octet rule.
- Use covalent radii to calculate bond lengths.
- Explain the modern interpretation of resonance bonding.
- Calculate the formal charge on atoms in molecules and evaluate Lewis structures on the basis of formal charge.
- Describe the shapes of simple covalently bonded molecules using VSEPR theory.
- Use bond dipoles to predict molecular dipoles.
- Define dipole and compare the strengths of intermolecular forces based on dipole moments.
- Describe hybrid orbitals and use hybridization theory to explain the bond angles in compounds.

- Differentiate sigma and pi bonding, and saturated and unsaturated carbon compounds.
- Define, explain, and give examples of isomerism.
- Determine bond order and correlate bond order, bond energy, and bond length.

Some Useful Websites for Bonding:

<http://chemistry.armstrong.edu/P1/Bonding.html> notes and some problems on bonding
<https://www.wisc-online.com/learn/natural-science/chemistry/gch6904/the-solid-state> Types of bonds
<http://antoine.frostburg.edu/chem/senese/101/compounds/faq/properties-ionic-vs-covalent.shtml>
<http://chemed.chem.purdue.edu/genchem/topicreview/bp/ch8/lewis.html#trial>
<http://www.shodor.org/unchem/basic/lewis/index.html#reson> Resonance structures
<http://www.mikeblaber.org/oldwine/chm1045/notes/Bonding/Resonan/Bond07.htm> Resonance structures
<http://www.chem.purdue.edu/gchelp/vsepr/example222.html> practice problems for VSEPR
http://www.chem.ox.ac.uk/vrchemistry/vsepr/intro/vsepr_splash.html includes interactive tutorial (at an advanced level) and problem set (you may need a plug-in)
<https://chemfiesta.org/2015/03/10/vsepr-theory/> (doesn't include the full range of geometries)
<https://www.masterorganicchemistry.com/2018/01/16/a-hybridization-shortcut/>
<http://chemed.chem.purdue.edu/genchem/topicreview/bp/ch8/hybrid.html> visualizing hybrid orbitals
<https://courses.lumenlearning.com/cheminter/chapter/hybrid-orbitals/>
<http://www.shef.ac.uk/chemistry/orbitron/> visualizing orbitals (uses Flash)

Shielding and Effective Nuclear Charge

http://employees.oneonta.edu/viningwj/sims/effective_nuclear_charge_s.html (uses Flash)
<http://facultyfp.salisbury.edu/dfriec/htdocs/212/rev/zeff/shielding.htm>

Metallic Bonding

<http://hyperphysics.phy-astr.gsu.edu/hbase/Solids/band.html> Introduces band theory
http://chemwiki.ucdavis.edu/Theoretical_Chemistry/Chemical_Bonding/General_Principles/Metallic_Bonding
http://www.rpi.edu/dept/phys/ScIT/InformationProcessing/semicond/sc_content/semi_30.html#

Intermolecular attractions:

<http://chemed.chem.purdue.edu/genchem/topicreview/bp/intermol/intermol.html>
<http://chemistry.bd.psu.edu/jircitano/IMforces.html>
<http://chemistry.elmhurst.edu/vchembook/160Aintermolec.html>
<http://www.ausetute.com.au/intermof.html>
http://www.chem.wisc.edu/deptfiles/genchem/netorial/rottosen/tutorial/modules/intermolecular_forces/index.htm
<https://www.wisc-online.com/learn/natural-science/chemistry/gch1004/the-hydrogen-bond>

Interested in exploring bonding in more depth?

<http://chemed.chem.purdue.edu/genchem/topicreview/bp/ch8/mo.php> Molecular orbital overview
https://www.ch.ic.ac.uk/vchemlib/course/mo_theory/main.html
<http://butane.chem.uiuc.edu/pshapley/genchem1/L10/1.html>