Dougherty Valley HS Chemistry - AP
Honors Review – Review of Commonly Missed Honors Topics

Worksheet #1

Name: **Period:** **Seat#:**

Directions:
This worksheet is not intended to be done in one night! You will have a couple days to work on it. Do some each night! The intention of this assignment is to make sure that you are *really* "solid" in your formulas so that you are not slowed down as we proceed into the new AP Chem material. This is the equivalent of learning your alphabet so you can write a five page essay in a timed write setting. If you don't know your alphabet you can't write words, sentences, paragraphs, or your five page essay!

In each blank:

a) Write the balanced chemical equation for the dissolution in water of this ionic compound
b) Highlight or circle the side that is predominant in a 1 M solution (use solubility rules!). If the reactant is not soluble then you would highlight the reactant side. If the reactant is soluble then you would highlight the product side.
c) If compound is a metal oxide or metal hydride, write the appropriate reaction with water, not a dissociation.
$MO + H_2O \rightarrow M(OH)$ $MH + H_2O(l) \rightarrow M(OH) + H_2(g)$
d) Here is a link to the solubility rules →

https://tinyurl.com/yau4dlfx

1) Zinc iodide
2) Potassium phosphate
3) Magnesium nitrate $Mg(NO_3)_2\ (s) \rightarrow Mg^{2+}\ (aq) + 2NO_3^-\ (aq)$
4) Lithium hydride
5) Calcium carbonate
6) Manganese (II) sulfide
7) Manganese (IV) hydride
8) Aluminum oxide
9) Sodium cyanide
10) Manganese (II) sulfate

11) Ammonium sulfide
12) Copper (III) oxide
13) Iron (II) chloride
14) Barium oxide
15) Calcium phosphate
16) Mercury (II) chloride
17) Calcium hydroxide
18) Sodium chromate
19) Aluminum nitrate
20) Potassium bromate
21) Cesium oxide
22) Cobalt (II) chloride
23) Zinc sulfide
24) Iron (II) nitrate
25) Sodium hypochlorite

Extras to Practice – You can (and will) be assigned some of these occasionally. They can (and will) show up on homework, pop quizzes, quizzes, tests, and the AP test.

26) Lithium nitride	**57)** Calcium hydroxide	**87)** Lithium bromide
27) Barium chloride	**58)** Iron (II) oxide	**88)** Potassium sulfite
28) Zinc hydroxide	**59)** Nickel (II) chloride	**89)** Potassium permanganate
29) Nickel (II) nitrate	**60)** Cobalt (II) nitrate	**90)** Ammonium thiocyanate
30) Potassium dihydrogen phosphate	**61)** Ammonium nitrate	**91)** Sodium oxalate
31) Magnesium oxide	**62)** Lead (II) carbonate	**92)** Sodium sulfide
32) Lithium oxide	**63)** Barium nitrate	**93)** Lithium carbonate
33) Silver chloride	**64)** Nickel (II) sulfate	**94)** Sodium chloride
34) Barium acetate	**65)** Copper (II) chloride	**95)** Potassium oxide
35) Sodium bromide	**66)** Tin (II) nitrate	**96)** Copper (II) sulfate
36) Sodium phosphate	**67)** Potassium hydrogen carbonate	**97)** Copper (II) sulfide
37) Calcium chloride	**68)** Strontium oxide	**98)** Magnesium carbonate
38) Calcium oxide	**69)** Potassium dihydrogen phosphate	**99)** Potassium bromide
39) Strontium nitrate	**70)** Iron (II) sulfite	**100)** Hydrogen peroxide
40) Calcium sulfite	**71)** Copper (II) oxide	**101)** Potassium thiocyanate
41) Sodium hydrogen carbonate	**72)** Sodium hydride	**102)** Manganese (IV) oxide
42) Sodium dichromate	**73)** Potassium sulfate	**103)** Copper (II) nitrate
43) Potassium iodate	**74)** Hydrogen chloride	**104)** Sodium chromate
44) Calcium fluoride	**75)** Nickel (II) bromide	**105)** Iron (III) oxide
45) Sodium fluoride	**76)** Strontium chloride	**106)** Ammonium carbonate
46) Iron (III) nitrate	**77)** Magnesium iodide	**107)** Barium hydroxide
47) Lead (II) acetate	**78)** Sodium acetate	**108)** Ammonium sulfate
48) Aluminum sulfate	**79)** Hydrogen iodide	**109)** Ammonium chloride
49) Potassium dichromate	**80)** Potassium carbonate	**110)** Potassium chlorate
50) Sodium sulfate	**81)** Iron (III) chloride	**111)** Sodium oxide
51) Lithium hydrogen carbonate	**82)** Sodium iodide	**112)** Potassium iodide
52) Sodium hydroxide	**83)** Lead (II) nitrite	**113)** Tin (II) chloride
53) Sodium permanganate	**84)** Hydrogen sulfide	**114)** Aluminum hydroxide
54) Sodium sulfite	**85)** Potassium hydroxide	**115)** Iron (III) sulfate
55) Zinc carbonate	**86)** Silver nitrate	**116)** Zinc nitrate
56) Calcium acetate		

Acid Naming

Acid naming is not always taught in all Honors Chem classes. If you need a tutorial on naming acids please see a brief overview here, or use Google…you have a world of info at your fingertips! Get used to using it! ☺
https://tinyurl.com/yd3zrord

1) Hydrofluoric acid	**2)** Phosphoric acid	**3)** Sulfuric aicd
4) Nitric acid	**5)** Hydrobromic acid	**6)** Oxalic acid
7) Formic acid	**8)** Nitrous acid	**9)** Hydroiodic acid
10) Acetic acid	**11)** Hydrochloric acid	**12)** Find one more acid not on this list, name it and write the formula.

Organic Compound Formulas

Naming organic compounds gets really tricky, really fast. We will not be covering much of this topic, but you should look up these commonly seen organic compounds on Google, so you start to notice some patterns. Try to look for the formula as well as the shape. The shape of the molecules may have some patterns to them. What do you notice about the prefix and the suffix of the compounds? Are there patterns? Noticing patterns like this can speed things up for you a lot during the year – it is a skill you should practice!

1) Ethanoic acid	**2)** Ethanol	**3)** Methanoic acid
4) Hexane	**5)** Butanol	**6)** Propane
7) 1-propanol	**8)** Ethanol	**9)** Ethane
10) Methane	**11)** Propene	**12)** Benzene
13) Propanoic acid	**14)** Dimethyl ether	**15)** Ethyne (acetylene)

Molecular Compounds

It is VERY important to know how to draw good Lewis Structures! It is one of the most frequently missed Honors Chem topics not because it is inherently difficult, but because people wont follow the steps! PLEASE use my method for drawing Lewis Structures because it will work every time! There is an overview of the steps below, but if you need more review please consider watching my YouTube lectures on this topic. Links are below.

Steps to Draw Lewis Dot Structures

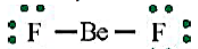
1) **Count** and sum valence electrons
2) **Place** atoms
   - Least electronegative atom in the center
   - Hydrogen is always on the outside
3) Bond all atoms with a **single bond**
4) Give all atoms a **full shell**
5) **Re-count** the # of e- used
6) **Used too few?** Give them to the central atom
7) **Used too many?** Try double or triple bonds to fix it!
   - Take a pair away from two neighboring atoms
   - Put a pair between them to form the extra bond
   - *"Take two away, put one back in between"*

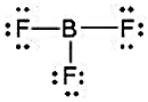
✓ **Correct number of valence electrons used ???**
✓ **Is each atom "happy" now ???**

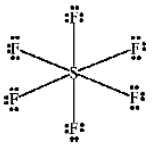
Exceptions to the Octet Rule

Some elements have a tendency to break the octet rule. This is a list of the common ones that break the rule. Please know that you should always draw the best structure possible, and sometimes that means something will break the octet rule even if it isn't listed here. You can only do the best you can do!

- **H – 2**
- **Li - 2**
- **Be - 4**
- **B - 6**
- **P - 10**
- **S – 12**







Part A	Part B	Part C
https://youtu.be/on_-k2-jvns	https://youtu.be/HeX66BXt2-w	https://youtu.be/KBP_sUPYK3E

Write the formula for the molecular compounds below, count the number of valence electrons the molecule has, and then draw a valid Lewis Structure. Make sure to use lines for bonds, and leave lone pairs as dots.

1) Phosphorus trihydride *Formula* *# of ve-* PH_3 8	**2)** Boron trifluoride *Formula* *# of ve-*	**3)** Sulfur dioxide *Formula* *# of ve-*
4) Sulfur trioxide *Formula* *# of ve-*	**5)** Ammonia *Formula* *# of ve-*	**6)** Dinitrogen pentoxide *Formula* *# of ve-*
7) Carbon disulfide *Formula* *# of ve-*	**8)** Carbon dioxide *Formula* *# of ve-*	**9)** Phosphorus pentachloride *Formula* *# of ve-*
10) Dinitrogen trioxide *Formula* *# of ve-*	**11)** Boron trichloride *Formula* *# of ve-*	**12)** Carbon monoxide *Formula* *# of ve-*

Strong and Weak Acids and Bases

Write the name. Write if it is a strong or weak acid. Write how it would be written in a 1.0 M solution. List of strong acids and bases is on the back of your common ion list. They need to get memorized ASAP!

S/W A/B List https://tinyurl.com/yd9w685k

Quizlet: https://tinyurl.com/yat3x6tg

S/W A/B List

Quizlet

Acid	Name	Strong/Weak?	How Written in 1.0 M
1) HF	Hydrofluoric acid	W	HF (aq)
2) HCl	Hydrochloric acid	S	H^+ (aq) + Cl^- (aq)
3) HBr			
4) H_2S			
5) $HClO_4$			
6) $HClO_3$			
7) $HClO_2$			
8) HClO			
9) HNO_3			
10) HNO_2			
11) H_2SO_4			
12) H_2SO_3			
13) H_2CO_3			
14) H_3PO_4			
15) $H_2C_2O_4$			
16) CH_3COOH			

Net Ionic Equations - Write, balance, and indicate phases. Write the molecular equation and the net ionic. You will need to use your solubility rules to decide if something is soluble and therefore aqueous and breaks into ions, or if it is insoluble so it is a solid and does not get broken apart into ions. The solubility rules are linked on the front page of this worksheet!

1) Solutions of zinc sulfate and sodium phosphate are mixed
Molecular: $3ZnSO_4$ (aq) + $2Na_3PO_4$ (aq) → $Zn_3(PO_4)_2$ (s) + $3Na_2SO_4$ (aq)
Net Ionic: $3Zn^{2+}$ (aq) + $2(PO_4)^{3-}$ (aq) → $Zn_3(PO_4)_2$ (s)
2) A solution of sodium sulfide is added to a solution of zinc nitrate
Molecular:
Net Ionic:
3) Solutions of silver nitrate and lithium bromide are mixed
Molecular:
Net Ionic:
4) Solutions of sodium iodide and lead (II) nitrate are mixed
Molecular:
Net Ionic:
5) Solutions of silver nitrate and sodium chromate are mixed
Molecular:
Net Ionic:
6) A solution of copper (II) sulfate is added to a solution of sodium hydroxide.
Molecular:
Net Ionic:
7) Sodium hydroxide solution is added to a solution of magnesium nitrate.
Molecular:
Net Ionic:

8) Solutions of potassium phosphate and zinc nitrate are mixed.
Molecular:
Net Ionic:
9) Solutions of manganese (II) sulfate and ammonium sulfide are mixed.
Molecular:
Net Ionic:
10) A solution of nickel (II) chloride is added to a solution of sodium sulfide.
Molecular:
Net Ionic:

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11) Solutions of cobalt (II) nitrate and sodium hydroxide are mixed.
12) A solution of copper (II) chloride is added to a solution of sodium sulfide.
13) Solutions of strontium nitrate and sodium sulfate are mixed.
14) Solutions of sodium chromate and lead (II) nitrate are mixed.
15) A solution of sodium iodide is added to a solution of lead (II) acetate.
16) Solutions of lead (II) nitrate and potassium sulfate are mixed.
17) A solution of sodium phosphate is mixed with a solution of calcium acetate.
18) A solution of sodium phosphate is added to a solution of aluminum nitrate.
19) Solutions of silver nitrate and sodium chloride are combined.
20) A solution of calcium hydroxide and sodium chloride are combined.

Extra Review

Everyone has had a summer off from chemistry, sometimes even more if you skipped a year between Honors Chem and AP Chem. Everyone can benefit from some extra review. Only you know which topics were hardest for you last year – spend some time looking through the materials on theHonors Chemistry Tab of my class website. http://mychemistryclass.net/honorschem.html

1st Semester Chapters

1. Chemistry Basics
2. Atomic Structure
3. Electrons
4. Periodic Table
5. Bonding and Structure
6. Reactions
7. Stoichiometry

2nd Semester Chapters

8. Advanced Chemical Ratios
9. Gas Laws
10. Thermochemistry
11. Solutions
12. Kinetics
13. Equilibrium
14. Acids and Bases

You can even watch all my Honors Chem lecture videos on my YouTube Channel!

https://tinyurl.com/5fa5bkh5