

Our Google Classroom Code: **uhwl6g**

Website: <https://sites.google.com/view/icanlearnchemistry>

Quizlet: <https://quizlet.com/join/hn2da7NBY>

Remind: <https://www.remind.com/join/4b4g63>

I use the Remind App, you can contact me anytime over the summer about the summer assignment. I will get back to you in a reasonable amount of time.

This is due on the first day back. If your packet is not completed on your first day back please know I will contact your parents directly and suggest you take a different course. It is for 200 points, it is grade on correctness, not effort.

This must be completed on lined paper. Showing All Work!

There will be a quiz on polyatomic ions, Strong Acids and Strong Bases on day one.

Polyatomic Ions to memorize (in Quizlet):

$C_2H_3O_2^-$	acetate	ClO^-	hypochlorite	SO_4^{2-}	sulfate
NO_3^-	nitrate	ClO_2^-	chlorite	CO_3^{2-}	carbonate
CN^-	cyanide	ClO_3^-	chlorate	PO_4^{3-}	phosphate
OH^-	hydroxide	ClO_4^-	perchlorate	NH_4^+	ammonium
MnO_4^-	permanganate	SO_3^{2-}	sulfite		

Strong Acids to memorize (strong acids break up 100% in water) in quizlet:

Hydrochloric Acid - HCl

Hydrobromic Acid - HBr

Hydroiodic Acid - HI

Nitric Acid - HNO_3

Chloric Acid - $HClO_3$

Perchloric Acid - $HClO_4$

Sulfuric Acid - H_2SO_4

Strong Bases to memorize (strong bases break up 100% in water) in quizlet:

Column 1 and OH^- | Example: LiOH is Lithium Hydroxide, it is a strong base

Column 2 and OH^- | Example $Ca(OH)_2$ is Calcium Hydroxide, it is a strong base

HOFBrINCl (Never travel alone)

Basic Atomic Structure (APE MAN)

How many protons, neutrons, electrons are in the following elements and what is their mass?

1. Na
2. Ag⁺
3. Ca²⁺
4. Fe²⁺
5. Fe³⁺
6. Br
7. Br⁻
8. O²⁻
9. N³⁻
10. K⁺
11. I⁻

Mole Triangle

12. How many moles of CH₄N₂O are in 396.12 grams of CH₄N₂O?
13. How many grams of CH₃COOH are in 0.42 moles of CH₃COOH?
14. How many moles of CH₃COOH are in 5.52 grams of CH₄N₂O?
15. How many grams of CH₄N₂O are in 3.2 moles of CH₃COOH?
16. How many molecules of NaCl are in 2.76 moles of NaCl?

Balancing Equations & Stoichiometry

17. Balance the following equation: $__ \text{Fe} + __ \text{Cl}_2 \rightarrow __ \text{FeCl}_3$

Use the balanced equation above to answer the following 5 questions

18. What mass iron would be necessary to produce 114.2 g iron(III) chloride?
19. If 152.3 g chlorine reacted with an excess of iron, what mass of iron(III) chloride would be produced?
20. What mass iron would be necessary to react with 100.6 g chlorine?
21. What mass chlorine would be necessary to produce 500. g iron(III) chloride?
22. What mass iron(III) chloride would be produced if 250. g iron reacted with an excess of chlorine?

23. Balance the following equation: $__ \text{Fe} + __ \text{O}_2 \rightarrow __ \text{Fe}_2\text{O}_3$

Use the balanced equation above to answer the following 5 questions

24. What mass of oxygen would be necessary to react with 50.0 g iron?
25. What mass iron would be necessary to react with 50.0 g oxygen?
26. What mass of iron would be necessary to produce 100.0 g iron(III) oxide?
27. What mass oxygen would be necessary to produce 500.0 g iron(III) oxide?
28. What mass iron(III) oxide would be produced by 60.3g iron reacting with an excess of oxygen?

Percent Composition

29. What is the percent composition of each element in $\text{Fe}_4(\text{P}_2\text{O}_7)_3$
30. What is the percent composition of each element in $\text{CH}_3\text{CH}_2\text{CONH}_2$

Electron Configuration & Noble Gas Configuration

Write the electron configuration, orbital notation, noble gas configuration for the following elements. Include the number of valence electrons.

31. Co
32. S
33. Ar
34. K^+
35. Cl^-

Lewis Dot Structures

Draw the following Lewis Dot Structures. For the central element include the following:

- a. Hybridization b. Shape c. Polarity d. # of sigma & pi bonds

Draw any resonance structures

36. NH_4^+
37. CO_3^{2-}
38. CH_3Br
39. PF_3
40. NO_3^-

Heat K = C + 273

41. Convert 300 K to $^\circ\text{C}$
42. Convert 32°C to K
43. Convert 200 K to $^\circ\text{C}$
44. Convert 432°C to K

Specific heat of water is $4.18 \text{ J} / \text{g} \cdot ^\circ\text{C}$

$$Q = mc\Delta T$$

45. How much heat must be absorbed by 2230 grams of water to raise its temperature from 35°C to 85°C ?

46. What mass of water can be heated from 25.0°C to 50.0°C by adding of 23325 J of heat?

47. A peanut has a mass of 9.63 g. 222.0 mL of water absorbs heat from the peanut and increases from 26.2°C to 35.1°C . The final mass of the peanut is 4.0g. How much heat is released from the peanut? How much heat is absorbed from by the water?

(The density of water is 1 g/mL)

Teach yourself (notes in GC, videos on website or Youtube)

Empirical & Molecular Formula

48. Analysis of a compound indicates that it contains 1.04 g K, 0.70 g Cr, and 0.86 g O. Find its empirical formula.

49. A compound contains 63.52% iron and 36.48% sulfur. What is its empirical formula?

50. A compound contains 36.48% Na, 25.41% S, and 38.11% O. What is its empirical formula?

51. Find the empirical formula of a compound that contains 26.56% potassium, 35.41% chromium and the remainder oxygen.

52. Analysis of 20.0 g of a compound containing only calcium and bromine indicates that 4.00 g of calcium are present. What is the empirical formula of the compound?

53. Determine the molecular formula of a compound with an empirical formula of CH and a formula mass of 78.110 amu.

54. What is the molecular formula of a compound that has an empirical formula of CH₂O and a molar mass of 120.12 g/mol?

55. A sample of a compound with a formula mass of 34.00 amu is found to consist of 0.44 g H and 6.92 g O. Find its molecular formula.

(Hint: find the empirical formula first!)

56. A compound with a formula mass of 42.08 amu is found to be 85.64% carbon and 14.36% hydrogen by mass. Find the molecular formula.

Oxidation Numbers -

Identify the oxidation number of each element in the compound

57. NaCl

63. OF₂

58. CaCl₂

64. MnO₄¹⁻

59. NO₃¹⁻

65. K₂SO₄

60. SO₄²⁻

66. CO₂

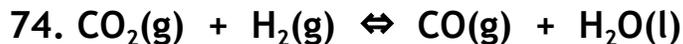
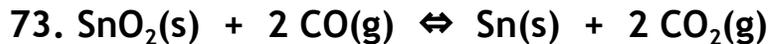
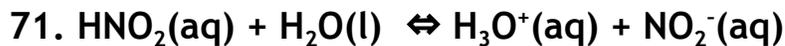
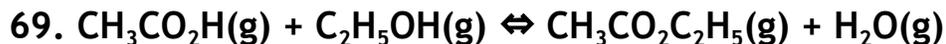
61. BrF

67. Na₂Cr₂O₇

62. Li₂CO₃

Equilibrium Constants

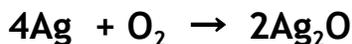
Write the equilibrium constants for the following chemical reactions



Can you do it? Extra Credit (3 points extra each):

No notes on this. You want extra credit? Go figure it out. All work must be shown.

Limiting & Excess Reagents



EC1. What mass silver oxide would be produced if 52.5 g oxygen was reacted with 33.3 g silver?

EC2. What would be the mass of the excess reactant remaining



EC3. What mass Fe_3O_4 would be produced if 55.5 g water is mixed with 68.2 g iron?

EC4. What mass excess reactant would remain?