

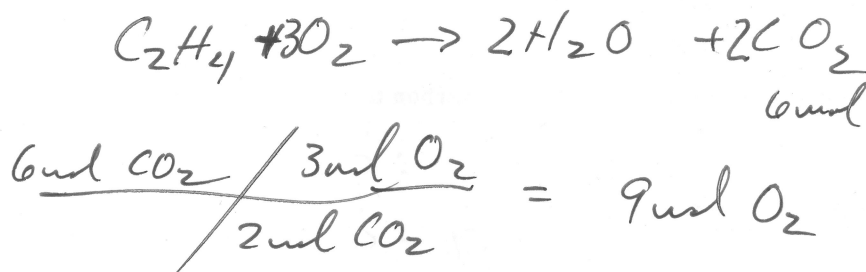
Review for Chemistry Final

Key

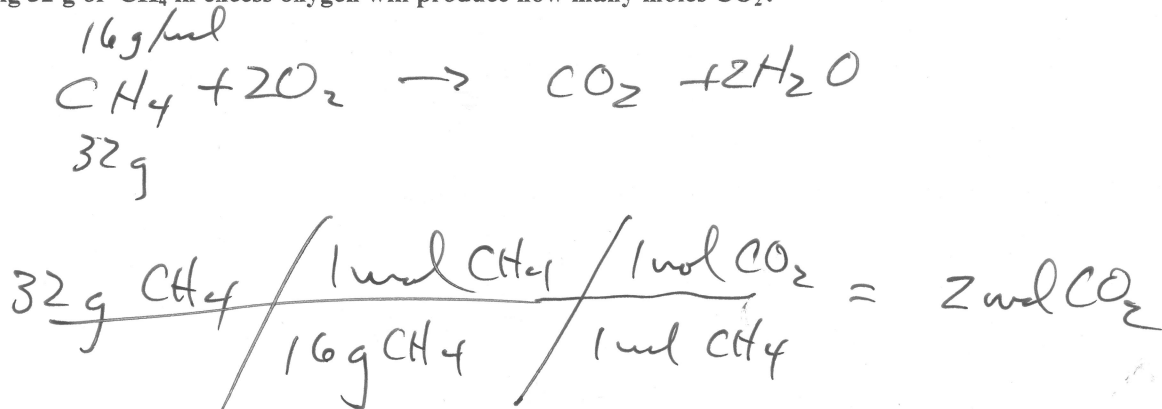
Know: (in your comp book)

- 1) Know the Acids – Strong and Weak
- 2) How to count Sig figs
- 3) How to round numbers to sig figs
- 4) How to identify Lipids, Carbohydrates, and proteins
- 5) How to identify molecule geometry (Linear, Bent or v-shape, and tetrahedral)
- 6) How to calculate density ($D = m/V$)
- 7) How to calculate molar mass
- 8) How to convert units (dimensional analysis)
- 9) How to convert temperatures (K, °F, °C)
- 10) Water properties (polar, high specific heat, etc.)
- 11) How to use the heat equation ($Q = mC_p\Delta T$)
- 12) How to use the change in state heat formula ($Q = mH$)
- 13) How to use the periodic table to identify metals, non metals, special groups, ionic bonds, covalent bonds, the seven diatomic elements, etc.
- 14) The 3 basic subatomic particles and their properties
- 15) Know the 4 variables required to characterize a gas
- 16) How to convert pressure units
- 17) How to calculate pH, pOH, and concentrations of H and OH ions
- 18) How to balance reactions
- 19) How to calculate limited reactants
- 20) How to convert moles to grams and number of molecules

1. C_2H_4 burns in oxygen gas to produce carbon dioxide and water. If 6.0 mol of CO_2 are produced, how many moles of O_2 were reacted?



2. Burning 32 g of CH_4 in excess oxygen will produce how many moles CO_2 ?



8. Metal atoms tend to lose + electrons and form + ions.

9. What is the difference between ionic and covalent bonds?

metal - non metal
transfer of e^- Ionic

nonmetal - nonmetal
sharing e^- covalent

10. What kinds of bonds do the following compounds contain? HCl, NaCl, CCl₄, SO₂, O₂

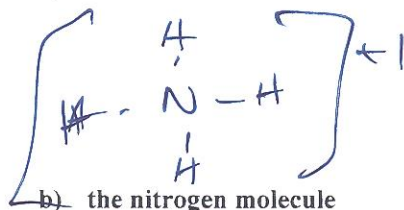
HCl, NaCl, CCl₄, SO₂, O₂
Ionic/polar covalent, Ionic, covalent, covalent, non polar covalent

11. The electron configuration for the Ca²⁺ ion is identical with _____.

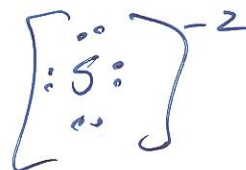
Argon [Ar]

12. Draw Lewis structures for :

a) ammonium



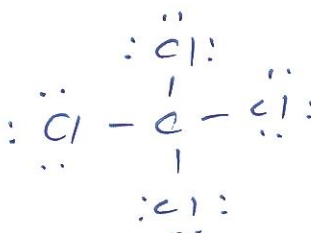
c) the sulfide ion



b) the nitrogen molecule



d) carbon tetrachloride



13. Convert 2 atm to psi.

$$\frac{2 \text{ atm}}{1 \text{ atm}} \times 14.7 \text{ psi} = 29.4 \text{ psi}$$

14. The lowest possible temperature that can be reached is _____.

[0K]

15. Convert 200K to Celsius.

$$K = C + 273$$

$$C = K - 273$$

$$200 - 273 = -73^\circ\text{C}$$

16. Calculate the pH of 0.0012 M HNO_3

$$-\log(.0012) = \boxed{2.92}$$

17. Fill in the chart below:

Periodic	Name	Symbol	#p	#n	#e	mass #
Group Alkaline metal	Sodium ion	Na	11	12	11	23
Halogen	Chlorine Ion	Cl ⁻	17	18	17 18	35
group 16	Oxygen	O	8	8	8 8	16
transition metal	lead Ion	Pb ⁺⁴	82	125	78	207
actinide	Uranium 240	²⁴⁰ ₉₂ U	92	148	92	240
Alkaline	Calcium	Ca ⁺²	← 20	← 21	← 18	
Earth metal	Ion					42

18. Convert 375g of mercury(II)oxide to moles.

$$375\text{g HgO} \div \frac{216.6\text{g}}{1\text{mol}} = \boxed{1.73\text{mol HgO}}$$

molar mass
 $\begin{array}{r} 200.6 \\ + 16.0 \\ \hline 216.6\text{g/mol} \end{array}$

19. How many grams of sulfur are in one mole of sulfur?

$$32.1\text{g S in 1mol of S}$$

20. How many molecules are in 795g of aluminum hydroxide?

$$795\text{g Al(OH)}_3 \div \frac{78\text{g}}{1\text{mol}} \div 6.022 \times 10^{23} = \boxed{6.14 \times 10^{24}\text{ molecules Al(OH)}_3}$$

molar mass
 $\begin{array}{r} \text{Al} \quad 27.0 \\ \text{O} \quad 16 \times 3 \quad 48 \\ \text{H} \quad 1 \times 3 \quad 3 \\ \hline 78\text{g/mol} \end{array}$