Assignment # 1
Organic 211
Fall 2020

Name:_____

1) Express the result of each calculation to the correct number of significant figures.

a) 25.7 – 25.25 = 0.45 rounds to 0.4 (even #) (will also take 0.5)

b) 12.4/35.66 = .338 2433/69 or 0.338

3 sig figs.

2) How many significant figures do the following numbers have?

a) 0.378000

6

b) 0.000378

3

c) 370

2

d) 370.

3

3) Describe how you would make 450. mLs of a 3.00 M NaOH aqueous solution. How would you make it? How much NaOH (s) in grams would you add? How much water?

$$3 \text{ moles} \left| \frac{40 \text{ g NaOH}}{1 \text{ mol}} \right| = 120 \text{ g}$$

$$\frac{120 \text{ g}}{1000 \text{ ml}} = \frac{x}{450}$$

120 x 450 = 54000

54000 / 1000 = 54.0 g

So 54 g of NaOH and 450 mls of H_2O.

4) Balance the following equations.

a) 1 C_5H_{10} + 15/2 O_2 → 5 CO_2 + 5 H_2O

b) 1 $C_6H_{12}O_6$ → 2 C_2H_6O + 2 CO_2

c) 1 $C_6H_{12}O_6$ + 6 O_2 → 6 CO_2 + 6 H_2O

d) 2 $NaClO_3$ → 2 NaCl + 3 O_2

e) 2 KNO3 + 1 S + 3 C → 3 CO2 + 1 K2S + 1 N2

5) a) Give the element symbol for the atom that has 6 protons, 7 neutrons, and 7 electrons.

$^{13}_{6}C^{-}$ $^{13}_{6}C$ 6+7=13 6−7 = −1

b) Give the elemental symbol for an neutral isotope of the symbol in part a.

$^{12}_{6}C$

c) Give an ion of the element symbol that has a +1 charge. Explain what is different than a.

$^{13}_{6}C^{+}$ this has only 5 electrons. 6−5 = +1 Has 6 electrons

6) How many milliliters of 5 M NaOH are required to completely neutralize 2 liters of 3 M H_2SO_4? SHOW YOUR WORK.

(2000 ml)(3 M) = (x)(5 M)

$\frac{6000}{5}$ = 1,200 ml or 1.2 liters

7) The valence shell of all alkaline earth metals can be designated as

a) Ns1 b) Ns2 c) Ns2Np1 d) Np1 e) Nd1

8) When a beta particle is emitted from an atomic nucleus,

a) the atomic number increases by one

b) the atomic number decreases by one

c) the atomic mass increases by one

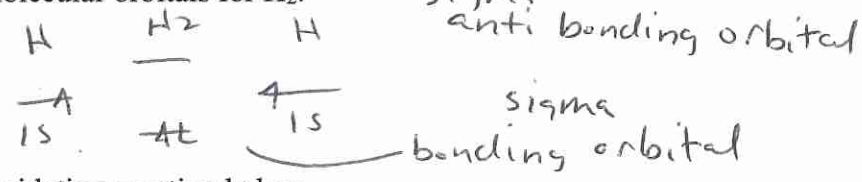
d) the atomic mass decreases by one

e) none of the above

8) What was the first molecule made?

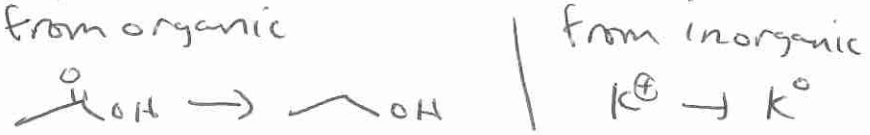
HHe^+

9) Give the molecular orbitals for H_2.

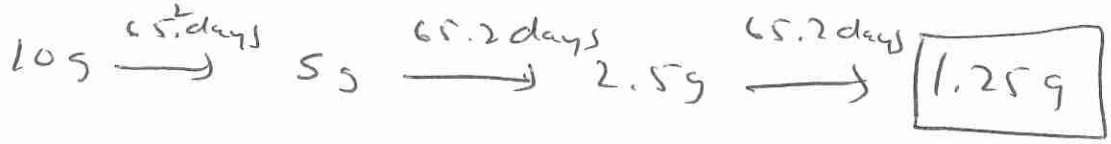


10) Give an oxidation reaction below.

11) Give a reduction reaction below.



12) Strontium-85 has a half life of 65.2 days. If we start with 10 grams of strontium-85 and wait 195.6 days, how much is left? SHOW YOUR WORK.



13) When does a star explode?

fusion happens until iron is made. at that point, the star explodes.

14) Give the electron configuration of Tungsten (+1).

$[Xe]\,6s^2\,4f^{14}\,5d^3$