Chem II Preparation

1. Convert 25°C to its Kelvin temperature.

2. How many moles are in 750 mL of a 1.2 M solution? How many millimoles?

3. Find the molarity of Ca^{+2} and Cl^{-} in a solution made from 3.2 g of $CaCl_2$ dissolved in 80 mL of water?

4. What is the oxidation state of P in PO_4^{3-}? What is the oxidation state of Cr in $K_2Cr_2O_7$?

5. Which of the following reactions are redox reactions?

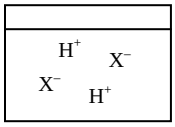
a) $2Na + Cl_2 \rightarrow 2NaCl$

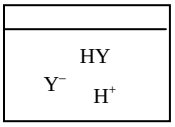
b) $Na_2CO_3 + 2HCl \rightarrow H_2CO_3 + 2NaCl$

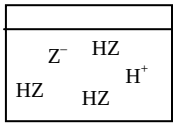
c) $Ca + MgSO_4 \rightarrow CaSO_4 + Mg$

d) $MgO + H_2O \rightarrow Mg(OH)_2$

6. Which solution is the most acidic: a, b, or c? Which is the strongest acid: HX, HY, or HZ?

a) 

b) 

c) 

7. How many covalent bonds do the elements C, H, O, and N generally make?

8. How many protons, neutrons and electrons are in $^{17}O^{2-}$?

9. $2AlCl_3 \rightarrow 2Al + 3Cl_2$
For each mole of aluminum chloride consumed, how many moles of chlorine gas are produced?

10. How many hydrogen atoms are in a half-gallon of water? 1 gallon = 3.785 L

11. Which of the following are present in $CaCl_2(aq)$? Check all that apply.

a. $Ca(s)$
b. $Cl_2(g)$
c. $CaCl_2(s)$
d. $H_2O(l)$
e. $Ca^{2+}(aq)$
f. $Cl_2(aq)$
g. $Cl^{-}(aq)$

Chem II Preparation

1. 298 K

2. 0.90 moles = 900 millimoles

3. $CaCl_2$ = 0.36 M Ca^{2+} = 0.36 M Cl^- = 0.72 M

4. P = +5 Cr = +6

5. a and c

6. Solution "a" contains the most H^+ ions and is therefore the most acidic. HX is 100% ionized and is therefore the strongest acid. HY is only 50% ionized (1 out of 2 HY molecules split into ions). HZ is only 25% ionized (1 out of 4 HZ molecules split into ions).

7. C makes 4 bonds, O makes 2 bonds, H makes 1 bond, N makes 3 bonds

8. 8 protons, 9 neutrons, 10 electrons

9. 1.5 moles

10. 1.266×10^{26} H atoms

11. d, e, and g