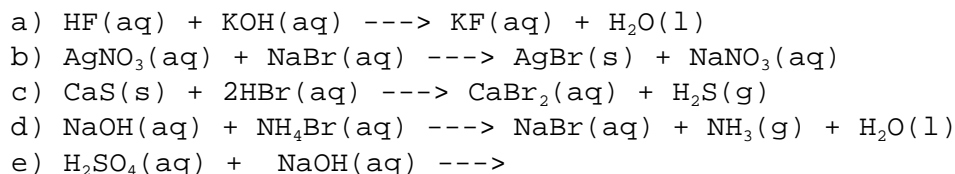
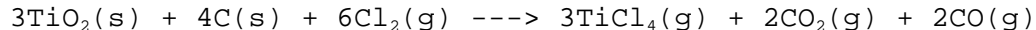


ON SEPARATE PAPER, work each of the following problems. SHOW ALL WORK in **neat** form TO RECEIVE CREDIT! Due: Day/Time of final (Mon.Dec.15, 9:00-10:50 a.m.).

1. Ethyl alcohol has a density of 0.789 g/cm^3 . What volume of ethyl alcohol must be poured into a graduated cylinder to give 19.8 g of alcohol?
2. Write net ionic equations for the following molecular equations. Be Careful on **WEAK ACIDS**.

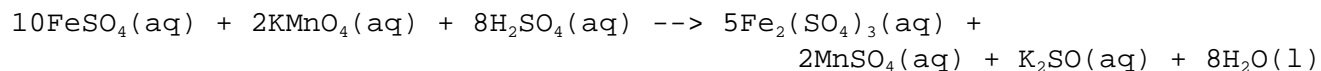


3. Seawater contains 0.00065% (by mass) of bromine. How many grams of bromine are there in 1.00 L of seawater? The density of seawater is 1.025 g/cm^3 .
4. Titanium, which is used to make airplane engines and frames, can be obtained from titanium tetrachloride, which in turn is obtained from titanium dioxide by the following process:



A vessel contains 4.15 g TiO_2 , 5.67 g C, and 6.78 g Cl_2 . Suppose the reaction goes to completion as written. How many grams of titanium tetrachloride can be produced.

5. How many grams of sodium dichromate, $\text{Na}_2\text{Cr}_2\text{O}_7$, should be added to a 50.0-mL volumetric flask to prepare 0.025 M $\text{Na}_2\text{Cr}_2\text{O}_7$ when the flask is filled to the mark with water? What are the Molarities of the Na^+ ion and the $\text{Cr}_2\text{O}_7^{2-}$ ion in the solution?
6. How many milliliters of 0.238 M KMnO_4 are needed to react with 3.36 g of iron(II) sulfate, FeSO_4 ? The reaction is as follows:



7. A 1.28-g sample of a colorless liquid was vaporized in a 250-mL flask at 121°C and 786 mmHg. What is the molecular weight of this substance?
8. Small amounts of hydrogen are conveniently prepared by reacting zinc with hydrochloric acid.
$$\text{Zn(s)} + 2\text{HCl(aq)} \rightarrow \text{ZnCl}_2\text{(aq)} + \text{H}_2\text{(g)}$$

How many grams of zinc are required to prepare 2.50 L H_2 gas at 765 mmHg and 22°C ?

9. The atmosphere in a sealed diving bell contained oxygen and

helium. If the gas mixture has 0.200 atm of oxygen and a total pressure of 3.00 atm, what is the pressure due to He? Calculate the mass of helium in 1.00 L of the gas mixture at 20°C.

10. Determine the amount of heat needed to raise 20.0 g of ice at 0°C to steam at 100°C.

($\Delta H_{\text{fusion}} = 334 \text{ J/g}$; $\text{SpHt}_{(\text{H}_2\text{O})} = 4.18 \text{ J/gc}$; $\Delta H_{\text{vap}} = 2.25 \text{ kJ/g}$)