

**Chemistry 105**  
**Practice Problems - Chemical Reactions**

1) Indicate whether each substance is soluble or insoluble in water:  
(a)  $\text{FeS}_2$       (b)  $\text{ZnBr}_2$       (c)  $\text{K}_2\text{SO}_4$       (d)  $\text{Ca}_3(\text{PO}_4)_2$       (e)  $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$       (f)  $\text{Al}(\text{C}_2\text{H}_3\text{O}_2)_3$

2) When the solution in *beaker 100* is mixed with the solution in *beaker 250*, a precipitate forms. Write down the equation for the full ionic form of the reaction and indicate spectator ions.

*beaker 100* -  $\text{Na}_2\text{CO}_3(\text{aq})$

*beaker 250* -  $\text{NiSO}_4(\text{aq})$

*beaker 100* -  $\text{K}_2\text{S}(\text{aq})$

*beaker 250* -  $\text{Fe}(\text{NO}_3)_3(\text{aq})$

*beaker 100* -  $\text{CaCl}_2(\text{aq})$

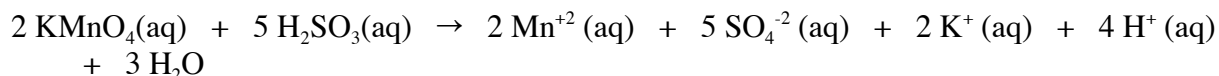
*beaker 250* -  $(\text{NH}_4)_2\text{SO}_4(\text{aq})$

3) Write down the chemical formulas of the ions that are formed when the following react with water.      aminopropane      butanoic acid       $\text{SrO}$        $\text{H}_2\text{SO}_4$

4) Write down the chemical equations for the neutralization reactions involving these acids and bases;

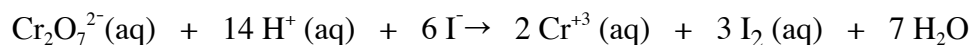
$\text{HCl}$  and  $\text{Ca}(\text{OH})_2$        $\text{H}_2\text{SO}_4$  and  $\text{KOH}$       butanoic acid and  $\text{KOH}$       aminopropane and  $\text{HCl}$

THE NEXT THREE QUESTIONS REFER TO THE FOLLOWING REDOX EQUATION:



- 5) What is the oxidation number of Mn in  $\text{KMnO}_4$ ?  
6) What element is oxidized in the reaction: K, Mn, S or H?  
7) How many moles of electrons are transferred based on the balanced equation?

THE NEXT THREE QUESTIONS REFER TO THE FOLLOWING REDOX EQUATION:



- 8) What is the oxidation number of Cr in  $\text{Cr}_2\text{O}_7^{2-}$ ?  
9) What element is reduced in the reaction: H, Cr, O or I?  
10) How many moles of electrons are transferred based on the balanced equation?