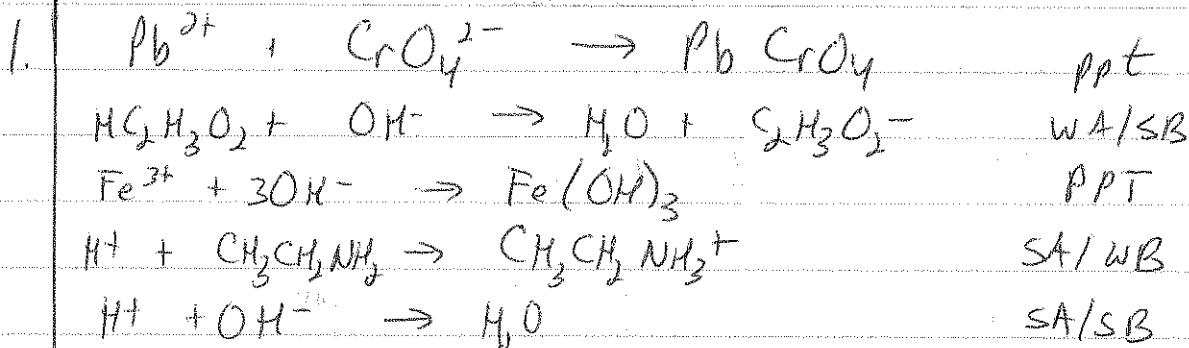


9/15/10

# CHAPTER 4 HOUSE CHALLENGES



$5.00g \text{ } H_3C_5H_5O_7 \times \frac{1 \text{ mL}}{180.0g} = 0.0278 \text{ mL } H_3C_5H_5O_7 \times \frac{1 \text{ mL } H_3C_5H_5O_7}{1 \text{ mL } H_3C_5H_5O_7} \Rightarrow$

$0.0833 \text{ mL } OH^- \times \frac{1 \text{ Sr(OH)}_2}{2 OH^-} = 0.0417 \text{ mL } Sr(OH)_2$

$M = \frac{0.0417 \text{ mL } Sr(OH)_2}{0.0653L} = 0.638M$



change to molar

$(0.0300 \text{ L})(0.2000 \text{ M}) = 6.00 \times 10^{-3} \text{ mL } Na_2CO_3 \times \frac{1 \text{ } CO_3^{2-}}{1 \text{ } Na_2CO_3} = 6.00 \times 10^{-3} \text{ mL } CO_3^{2-}$

$(0.0250 \text{ L})(0.1500 \text{ M}) = 3.75 \times 10^{-3} \text{ mL } LaCl_3 \times \frac{1 \text{ } La^{3+}}{1 \text{ } LaCl_3} = 3.75 \times 10^{-3} \text{ mL } La^{3+}$

ratio OK

$6.00 \times 10^{-3} \text{ mL } CO_3^{2-} \times \frac{1 \text{ } La_2(CO_3)_3}{3 \text{ } CO_3^{2-}} = 2.00 \times 10^{-3} \text{ mL } La_2(CO_3)_3$

$3.75 \times 10^{-3} \text{ mL } La^{3+} \times \frac{1 \text{ } La_2(CO_3)_3}{2 \text{ } La^{3+}} = 1.875 \times 10^{-3} \text{ mL } La_2(CO_3)_3$

AMS

$1.875 \times 10^{-3} \text{ mL } La_2(CO_3)_3 \cdot \frac{541.86g}{1 \text{ mL}} = 1.02 \text{ grams}$

" not a lot"

(c)  $[La^{3+}] = 0.001 M$  This is L.R.  
some  $C_2O_4^{2-}$  is used:

$$3.75 \times 10^{-3} \text{ mol } La^{3+} \cdot \frac{3 C_2O_4^{2-}}{2 La^{3+}} = 5.625 \times 10^{-3} \text{ mole } C_2O_4^{2-} \text{ USED}$$

$$(6.00 \times 10^{-3}) - (5.625 \times 10^{-3}) = 3.75 \times 10^{-4} \text{ mol } C_2O_4^{2-} \text{ left}$$

$$[C_2O_4^{2-}] = \frac{3.75 \times 10^{-4} \text{ mol}}{0.055 \text{ L}} = 0.00681 M$$

↑ total volume

$Na^+$  and  $Cl^-$  are spectator ions

original amounts →

$$6.00 \times 10^{-3} \text{ mol } Na_2C_2O_4 \times \frac{2 Na^+}{1 Na_2C_2O_4} = 1.2 \times 10^{-2} \text{ mol } Na^+$$

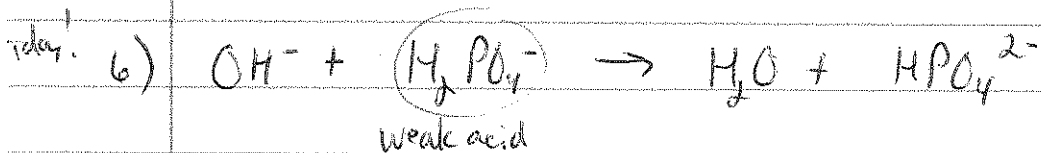
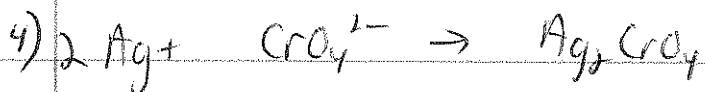
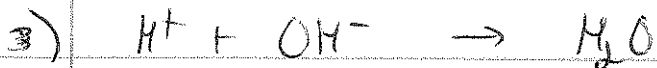
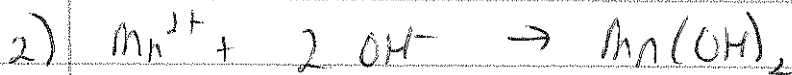
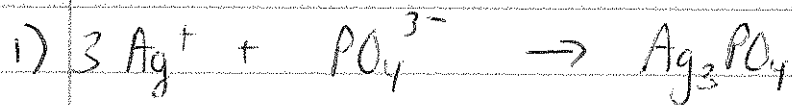
$$3.75 \times 10^{-3} \text{ mole } LaCl_3 \times \frac{3 Cl^-}{1 LaCl_3} = 1.125 \times 10^{-2} \text{ mol } Cl^-$$

$$[Na^+] = \frac{1.2 \times 10^{-2} \text{ mol}}{0.055 \text{ L}} = 0.218 M$$

$$[Cl^-] = \frac{1.125 \times 10^{-2}}{0.055 \text{ L}} = 0.205 M$$



## NET IONICS



$\text{Na}^+$  is  
spectator

