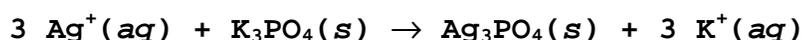# CHEM 35
General Chemistry
Quiz #5

October 27, 2000

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1.   A sample of 70.5 mg of K_3PO_4 (MW = 212.266 g/mol) is added to 15.0 mL of 0.050 M $AgNO_3$, resulting in the formation of a precipitate.

    a.   *(2 pts)* Write a balanced net ionic equation for this reaction.

    $$3 \; Ag^+(aq) \; + \; K_3PO_4(s) \; \rightarrow \; Ag_3PO_4(s) \; + \; 3 \; K^+(aq)$$

    b.   *(2 pts)* What is the limiting reactant in this reaction.

$0.0705 \; g \; K_3PO_4 \; \times \; \dfrac{mol \; K_3PO_4}{212.266 \; g \; K_3PO_4} \; \times \; \dfrac{3 \; mol \; AgNO_3}{1 \; mol \; K_3PO_4} \; \times \; \dfrac{L}{0.050 \; mol \; AgNO_3} \; \times \; \dfrac{1000 \; mL}{L} \; =$

19.9 mL $AgNO_3$
(needed)

Only 15 mL $AgNO_3$ available, so
$AgNO_3$ is LIMITING REACTANT

    c.   *(2 pts)* Calculate the mass (g) of precipitate formed in this reaction

$0.0150 \; L \; AgNO_3 \; \times \; \dfrac{0.050 \; mol \; AgNO_3}{L} \; \times \; \dfrac{1 \; mol \; Ag_3PO_4}{3 \; mol \; AgNO_3} \; \times \; \dfrac{418.576 \; g \; Ag_3PO_4}{mol \; Ag_3PO_4} \; =$

$= \; 0.10464 \; g \; Ag_3PO_4$
$= \; \underline{0.10 \; g \; Ag_3PO_4}$

2.   *(2 pts each)* Each of the following reactions produces a gas as one of its products. For each reaction, write a balanced reaction equation.
       a. $CaCO_3(s) + HNO_3(aq) \rightarrow$ **products**

$$CaCO_3(s) \; + \; 2 \; HNO_3(aq) \; \rightarrow \; Ca(NO_3)_2(aq) \; + \; H_2O(l) \; + \; CO_2(g)$$

       b. $Cu(s) + HNO_3(aq) \rightarrow$ **products**

$$Cu(s) \; + \; 2 \; HNO_3(aq) \; \rightarrow \; Cu(NO_3)_2(aq) \; + \; H_2(g)$$