**Chemistry 20 – Lesson 35**

**Limiting reactants – stoichiometry**

**/110**

**Practice problem**

1. 

 

A. Find the limiting reactant.

B. Calculate % error.



C. To determine the remaining ions in solution, begin with the total ionic equation and then calculate the moles of each species that remains in solution.



D. Calculate the concentration of each ion. Since 40.0 mL was added to 30.0 mL, the final volume is 70.0 mL.



**Assignment**

1. 

/10   

A. Find the limiting reactant.



The limiting reactant is the hydrogen gas.

B. Calculate % error.



2. 

/10  

A. Find the limiting reactant.

B. Calculate % error.



3. 

/10   

A. Find the limiting reactant.



B. Calculate % error.



4. 

/10   

A. Find the limiting reactant.



B. Calculate % error.



5. 

/10   

A. Find the limiting reactant.

B. Calculate % error.



6. 

/10   

A. Find the limiting reactant.



7. 

/10  

A. Find the limiting reactant.



B. Since Pb(NO3)2 is the limiting reactant, all of it would have reacted with the NaCl. Therefore, **sodium chloride remains**. To determine the amount of remaining NaCl we must first calculate the amount of NaCl that reacted with the lead (II) nitrate.



Subtracting the amount reacted from what was initially present we get the amount of NaCl remaining.

nNaCl remaining = 0.21 mol – 0.030 mol = 0.18 mol

Now calculate mass



8. 

/10   

A. Find the limiting reactant.



B. Calculate % error.



9. 

/10   

A. Find the limiting reactant.

B. Calculate % error.



C. Since Sc3+ is the limiting reactant, all of it would have reacted with the S2–. Therefore, **S2– remains**. To determine the concentration of the remaining S2– we must first calculate the amount of S2– that reacted with the Sc3+.



Subtracting the amount reacted from what was initially present we get:



Now calculate concentration



10. 

/10   

A. Find the limiting reactant and the mass of the precipitate.



B. Since the gallium ions are spectator ions:



C. Since all the barium ions reacted to form the precipitate, the remaining concentration of barium ions in solution is zero.

11. 

/10   

A. Find the limiting reactant and the mass of the precipitate.



B. To determine the concentration of the remaining Pb2+ we must first calculate the amount of Pb(ClO3)2 that reacted with the CaI2.



Subtracting the amount reacted from what was initially present we get:



Now calculate concentration



C. Since the calcium ions are spectator ions:

