

Schedule Adjustments

Thursday (D) - ~~Beer's Law Lab~~ *Review*
Pre-lab

Friday (A) - ~~Review~~ *Beer's Law Lab*

Sep 16-7:14 AM

Stoichiometry

When 32.6 g of barium nitrate are reacted with sodium phosphate, how many molecules of the insoluble product are produced?



$$32.6 \text{ g Ba}(\text{NO}_3)_2 \times \frac{1 \text{ mole}}{261.34 \text{ g}} \times \frac{1 \text{ Ba}_3(\text{PO}_4)_2}{3 \text{ Ba}(\text{NO}_3)_2} \times \frac{6.022 \times 10^{23} \text{ mc}}{1 \text{ mole}} = 2.50 \times 10^{22} \text{ mc Ba}_3(\text{PO}_4)_2$$

Sep 4-10:21 PM

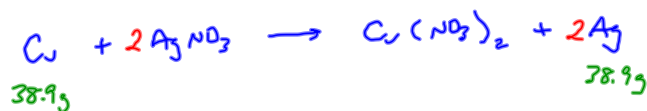
How many milliliters of a 2.04 M solution of lead II hydroxide are required to react completely with 18.17 g of nitric acid?



$$18.17 \text{ g HNO}_3 \times \frac{1 \text{ mol}}{63.0128 \text{ g}} \times \frac{1 \text{ Pb(OH)}_2}{2 \text{ HNO}_3} \times \frac{1000 \text{ mL}}{2.04 \text{ mol}} = 70.7 \text{ mL Pb(OH)}_2$$

Sep 4-10:22 PM

If a 38.9 g piece of copper is dropped into a solution of silver nitrate and 38.9 g of silver are produced, what is the percent yield?



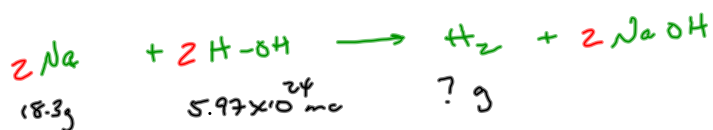
$$38.9 \text{ g Cu} \times \frac{1 \text{ mol}}{63.546 \text{ g}} \times \frac{2 \text{ Ag}}{1 \text{ Cu}} \times \frac{107.8682 \text{ g}}{1 \text{ mol}} = 132 \text{ g Ag}$$

$$\% \text{ yield} = \frac{\text{got}}{\text{should get}} \times 100 = \frac{38.9 \text{ g Ag}}{132 \text{ g Ag}} \times 100 = 29.5\%$$

← make answer
same units
as got

Sep 4-10:22 PM

When 18.3 g of sodium are dropped into 5.97×10^{24} molecules of water, how many g of hydrogen are produced?



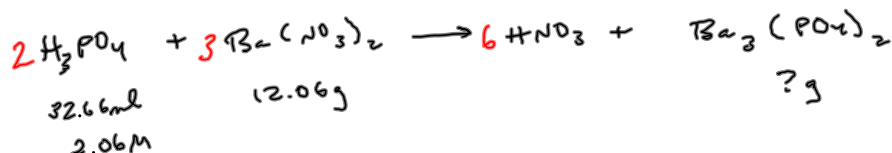
$$18.3 \text{g Na} \times \frac{1 \text{ mol}}{22.989770 \text{ g}} \times \frac{1 \text{ H}_2}{2 \text{ Na}} \times \frac{2.01588 \text{ g}}{1 \text{ mol}} = 0.802 \text{g H}_2$$

$$5.97 \times 10^{24} \text{ H}_2\text{O} \times \frac{1 \text{ mol}}{6.022 \times 10^{23} \text{ molecules}} \times \frac{1 \text{ H}_2}{2 \text{ H}_2\text{O}} = 4.96 \text{ mol H}_2$$

9.99 g H₂

Sep 4-10:23 PM

When 32.66 mL of a 2.06 M solution of phosphoric acid react with 12.06 g of barium nitrate, how many g of barium phosphate are produced? What is the limiting reagent? Which reactant is in excess? How much excess is there?



$$32.66 \text{ mL H}_3\text{PO}_4 \times \frac{2.06 \text{ mol}}{1000 \text{ mL}} \times \frac{1 \text{ Ba}_3(\text{PO}_4)_2}{2 \text{ H}_3\text{PO}_4} \times \frac{601.924 \text{ g}}{1 \text{ mol}} = 20.3 \text{g}$$

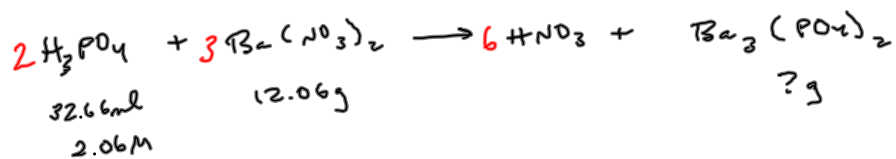
$$12.06 \text{g Ba}(\text{NO}_3)_2 \times \frac{1 \text{ mol}}{261.337 \text{ g}} \times \frac{1 \text{ Ba}_3(\text{PO}_4)_2}{3 \text{ Ba}(\text{NO}_3)_2} = 9.259 \text{g}$$

$$9.259 \text{g Ba}_3(\text{PO}_4)_2 \times \frac{1 \text{ mol}}{601.924 \text{ g}} \times \frac{2 \text{ H}_3\text{PO}_4}{1 \text{ Ba}_3(\text{PO}_4)_2} \times \frac{1000 \text{ mL}}{2.06} = \text{mL H}_3\text{PO}_4 \text{ used}$$

$$\text{XS} = 32.66 \text{ mL} - \text{used}$$

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When 32.66 mL of a 2.06 M solution of phosphoric acid react with 12.06 g of barium nitrate, how many g of barium phosphate are produced? What is the limiting reagent? Which reactant is in excess? How much excess is there?



$$32.66 \text{ mL H}_3\text{PO}_4 = \frac{2.06 \text{ mol}}{1000 \text{ mL}} \times \frac{1 \text{ Ba}_3(\text{PO}_4)_2}{2 \text{ H}_3\text{PO}_4} \times \frac{601.92 \text{ g}}{1 \text{ mol}} = 20.25 \text{ g}$$

$$12.06 \text{ g Ba}(\text{NO}_3)_2 \times \frac{1 \text{ mol}}{261.337 \text{ g}} \times \frac{1 \text{ Ba}_3(\text{PO}_4)_2}{3 \text{ Ba}(\text{NO}_3)_2} = 9.259 \text{ g}$$

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