

5 moles of 2<sup>nd</sup> reactant = ? moles 1<sup>st</sup> prod

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Ok, I know we have done a lot of this. We tried the direct approach and the results were not very stellar. Now prove what you are capable of with the equations. All will balance. Show all work in such a way that can be interpreted for credit if needed. Start by balancing these equations. Then calculate the mass of each reactant and the masses of each product. Sum the reactants and products to show that they are equal.

<p>1. <math>2\text{Na}_2\text{O}_2 + 2\text{H}_2\text{O} \rightarrow 4\text{NaOH} + \text{O}_2</math></p> <p>5 moles <math>2:4</math> 10 moles of NaOH</p> <p>Mass of <math>\text{Na}_2\text{O}_2</math> = _____            Mass of <math>\text{H}_2\text{O}</math> = _____            Sum of masses = _____</p>	<p>Mass of <math>\text{NaOH}</math> = _____            Mass of <math>\text{O}_2</math> = _____            Sum of masses = _____</p>	<p><math>5 \times \frac{4 \text{ moles NaOH}}{2} = 10 \text{ moles}</math></p>
<p>2. <math>2\text{Al} + 6\text{HCl} \rightarrow 2\text{AlCl}_3 + 3\text{H}_2</math></p> <p>5 moles <math>6:2</math> 1.67 moles <math>\text{AlCl}_3</math></p> <p>Mass of <math>\text{Al}</math> = _____            Mass of <math>\text{HCl}</math> = _____            Sum of masses = _____</p>	<p>Mass of <math>\text{AlCl}_3</math> = _____            Mass of <math>\text{H}_2</math> = _____            Sum of masses = _____</p>	<p>5 moles <math>\text{HCl}</math> &amp; 2 moles <math>\text{AlCl}_3</math>  <math>6 \text{ moles HCl}</math></p>
<p>3. <math>\text{PCl}_5 + 4\text{H}_2\text{O} \rightarrow 5\text{HCl} + \text{H}_3\text{PO}_4</math></p> <p>5 moles <math>\text{H}_2\text{O}</math> <math>4:5</math> 6.25 moles</p> <p>Mass of <math>\text{PCl}_5</math> = _____            Mass of <math>\text{H}_2\text{O}</math> = _____            Sum of masses = _____</p>	<p>Mass of <math>\text{HCl}</math> = _____            Mass of <math>\text{H}_3\text{PO}_4</math> = _____            Sum of masses = _____</p>	<p>5 moles <math>\text{H}_2\text{O}</math> &amp; 5 moles <math>\text{HCl}</math>  <math>4 \text{ moles H}_2\text{O}</math>  <math>= 6.25 \text{ moles HCl}</math></p>
<p>4. <math>\text{Al}_2(\text{SO}_4)_3 + 3\text{Ca}(\text{OH})_2 \rightarrow 2\text{Al}(\text{OH})_3 + 3\text{CaSO}_4</math></p> <p>5 moles <math>\text{Ca}(\text{OH})_2</math> <math>3:2</math> 3.33 moles <math>\text{Al}(\text{OH})_3</math></p> <p>Mass of <math>\text{Al}_2(\text{SO}_4)_3</math> = _____            Mass of <math>\text{Ca}(\text{OH})_2</math> = _____            Sum of masses = _____</p>	<p>Mass of <math>\text{Al}(\text{OH})_3</math> = _____            Mass of <math>\text{CaSO}_4</math> = _____            Sum of masses = _____</p>	<p>5 moles <math>\text{Ca}(\text{OH})_2 \times \frac{2 \text{ mole Al}}{3 \text{ mole Ca}(\text{OH})_2}</math>  <math>= 3.33 \text{ mol Al}(\text{OH})_3</math></p>
<p>5. <math>\text{FeCl}_3 + 3\text{NH}_4\text{OH} \rightarrow \text{Fe}(\text{OH})_3 + 3\text{NH}_4\text{Cl}</math></p> <p>5 mol <math>\text{NH}_4\text{OH}</math> <math>3:1</math> _____ moles <math>\text{Fe}(\text{OH})_3</math></p> <p>Mass of <math>\text{FeCl}_3</math> = _____            Mass of <math>\text{NH}_4\text{OH}</math> = _____            Sum of masses = _____</p>	<p>Mass of <math>\text{Fe}(\text{OH})_3</math> = _____            Mass of <math>\text{NH}_4\text{Cl}</math> = _____            Sum of masses = _____</p>	<p>5 mol <math>\text{NH}_4\text{OH} \times \frac{1 \text{ mol Fe}(\text{OH})_3}{3 \text{ mol NH}_4\text{OH}}</math>  <math>= 1.67 \text{ mol Fe}(\text{OH})_3</math></p>