Law of Conservation of Mass

The Law: matter cannot be created nor destroyed

Example: mass of R = mass of P

On mixing 2 aqueous solutions you observe from the products that a neutralization reaction has occurred. The equation and the results below illustrate this chemical reaction.

A(aq)	+	B(aq)	→	C(aq)	+	D(l)
35 g		? g		75 g		56 g

What is the mass of B that reacted? 96 g

1) When 191 g of copper is combined with 756 g of a nitric acid solution HNO_3 the chemical reaction produces 563 g of copper nitrate $Cu(NO_3)_2$, 108 g of water and a certain amount of nitrogen dioxide. (II)

Write the balanced chemical equation first:

$$\underset{191g}{Cu(s)} + \underset{756g}{HNO_3(aq)} \rightarrow \underset{563g}{Cu(NO_3)_2(aq)} + \underset{108g}{H_2O(l)} + \underset{x?}{NO_2(g)}$$

What mass of nitrogen dioxide does this reaction produce?

276 g NO_2

acid!

2) A reaction involving 168 g of sodium hydrogen carbonate (BS) and 120 g of vinegar produces 88 g of carbon dioxide, 36 g of water and a certain amount of salt.

Write the balanced chemical equation first:

$$\underset{168g}{NaHCO_3(s)} + \underset{120g}{CH_3COOH(aq)} \rightarrow \underset{88g}{CO_2(g)} + \underset{36g}{H_2O(l)} + \underset{x?}{NaCH_3COO(aq)}$$

How much salt is produce?

164 g $NaCH_3COO$

HH = Hydrocarbon

3) The reaction caused by the burning of lighter fluid or butane C_4H_{10} in air produces energy and carbon dioxide and water.

Write the balanced chemical equation indicating which side the energy is on:

$$C_4H_{10}(g) + \frac{13}{2}O_2(g) \rightarrow 4CO_2(g) + 5H_2O(l)$$

29g x? 88g 45g

During a lab, you react 29 g of butane. You observe that 88 g of carbon dioxide and 45 g of water vapour form.

What mass of oxygen from the air reacted with the butane?

104g O_2

Fill in the blank with the correct number of grams.

Write the balanced chemical equations for the following including proper subscripts.

1) 40 g of calcium reacts with 71 g of chlorine to produce 111 g of calcium chloride $CaCl_2$.

green poisonous disinfecting gas

$$Ca(s) + Cl_2(g) \rightarrow CaCl_2(s)$$

40g 71g x?

2) 78 g of potassium reacts with 16 g of oxygen to produce 94 g of potassium oxide K_2O.

$$K(s) + O_2(g) \rightarrow K_2O(s)$$

x? 16g 94g

3) 2 g of hydrogen reacts with 32 g of oxygen to produce 34 g of hydrogen peroxide.

$$\underset{x?}{H_2(g)} + \underset{32g}{O_2(g)} \rightarrow \underset{34g}{H_2O_2(l)}$$

4) 65.5 g of copper reacts with 15.5 g of oxygen to produce 81 g of copper (1) oxide CuO.

$$\underset{65.5g}{Cu(s)} + \underset{x?}{O_2(g)} \rightarrow \underset{81g}{CuO(s)}$$

5) 24.3 g of magnesium reacts with 38 g of fluorine to produce 62.3 g of magnesium fluoride MgF_2.

$$\underset{24.3g}{Mg(s)} + \underset{38g}{F_2(g)} \rightarrow \underset{x?}{MgF_2(s)}$$

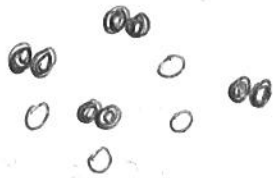
6) 14 g of lithium reacts with 32 g of sulfur to produce 46 g of lithium sulfide Li_2S.

$$\underset{14g}{Li(s)} + \underset{x?}{S_{8(s)}} \rightarrow \underset{46g}{Li_2S(s)}$$

7) 320 g of iron reacts with 71 g of chlorine to produce 391 g of iron (2) chloride $FeCl_2$.

$$\underset{x?}{Fe(s)} + \underset{71g}{Cl_2(g)} \rightarrow \underset{391g}{FeCl_2(s)}$$

Classify the following as atoms or molecules, elements or compounds, homogeneous or heterogeneous mixtures:

1 atoms 	2 molecules 
3 element 	4 cpd 
5 homo 2 elements 	6 Retero 2 elements 
7 homo 1ele & 1cpd 	8 Retero 2 cpds.