Lithium hydroxide reacts with hydrogen bromide.

- Write and balance the reaction
- If you start with 10 grams of lithium hydroxide, how many grams of lithium bromide will be produced?

$$Ca + LiCl \longrightarrow Li + CaCl_2$$

- Balance the reaction.
- If you start with 5 kg of lithium chloride, how many grams of calcium chloride will be produced?

$$C_2H_4 + O_2 \longrightarrow CO_2 + H_2O$$

- Balance the reaction.
- If you completely react 0.45 grams of ethylene (C_2H_4) with oxygen how many moles of oxygen will you use?

Making Bleaching Powder

One way to produce bleaching powder is from hydrochloric acid. Hydrochloric acid can be generated by reacting sodium chloride with sulphuric acid. If you want to manufacture 33.3 grams of hydrochloric acid, how many grams of sulfuric acid need to be added?

$$Na_2O_2 + H_2O \longrightarrow NaOH + O_2$$

- Balance the reaction.
- How many grams of sodium peroxide must react with water to produce 2.63 moles of sodium hydroxide?

$Zn + HCl \longrightarrow ZnCl_2$

- Balance the reaction.
- If you completely react 0.006 moles of hydrochloric acid, how man grams of Zn do you need?

Heat Treat Hand Warmers

Hand warmers rely on the exothermic reaction of iron with air. The average hand warmer contains 0.477g of iron, how much Fe_2O_3 will be produced if all the iron reacts?

$$Fe(s) + O_2(g) \longrightarrow Fe_2O_3(s)$$

Role of Grasslands in CO2 uptake

In a square foot of grassland, plants can produce 20g of sugar a day.

Photosynthesis: $6CO_2 + 6H_2O \longrightarrow C_6H_{12}O_6 + 6O_2$

a) How many moles of O_2 are produced?
b) What is the minimum amount of carbon dioxide needed in grams?
c) If there are 375337193 square feet in the Konza Grassland, how many grams of CO_2 are removed from the atmosphere in a day?

Extra Credit:
In actuality plants undergo respiration release 10.2 g per square foot of carbon a day as CO_2. What is the net uptake of CO_2 in the Konza grassland?

Fatty Camels

The camel stores the fat tristearin, C57H110O6, in its hump. As well as being a source of energy, the fat is also a source of water because when it is used, the following reaction takes place:

$2\ C_{57}H_{110}O_6 + 163\ O_2 \text{-->} 114\ CO_2 + 110\ H_2O$

a) What mass of water is produced from 35 kg of fat?

b) Given the fact that 1g of water equals 1 mL of water, how many liters of water could be produced from 35 kg of camel fat?

c) How many moles of oxygen are needed to react with 35kg of fat?