Stoichiometry and The Mole Hole

Example One:
How many grams of potassium chloride can be produced from 3.50 g of solid potassium and excess chlorine gas?

$$2\ K\ (s) + Cl_2\ (g) \rightarrow 2\ KCl\ (s)$$

Molar Masses	
K	39.10 g/mol
Cl_2	70.91 g/mol
KCl	74.55 g/mol

Example Two:
How many grams of water are produced from the combustion of 32.0 g of methane (CH_4) and excess oxygen as shown in the reaction below.

$$CH_4 + 2O_2 \rightarrow CO_2 + 2\ H_2O$$

Molar Masses	
CH_4	16.04 g/mol
O_2	32.00 g/mol
CO_2	44.01 g/mol
H_2O	18.02 g/mol

Example Three

How many moles of iron (III) oxide are produced from the reaction of excess iron with 4.0 moles of oxygen?

$$4\ Fe + 3\ O_2 \rightarrow 2\ Fe_2O_3$$

Molar Masses	
Fe	55.85 g/mol
O_2	32.00 g/mol
Fe_2O_3	159.69 g/mol

Example Four

How many grams of carbon dioxide can be produced from 2.50 g of octane and excess oxygen gas?

$$2\ C_8H_{18} + 25\ O_2 \rightarrow 18\ H_2O + 16\ CO_2$$

Molar Masses	
C_8H_{18}	114.23 g/mol
O_2	32.00 g/mol
H_2O	18.02 g/mol
CO_2	44.01 g/mol

Example Five

How many moles of iron are required to produce 10.0 g of iron (III) oxide using excess oxygen? How many moles of oxygen are required?

$$4\ Fe + 3\ O_2 \rightarrow 2\ Fe_2O_3$$