The Limiting Reactant

$$2CuCl + Mg \rightarrow MgCl_2 + 2\ Cu$$

If reactants are mixed according to the mole ratio (stoichiometric amounts), there will be no leftover chemicals.

This rarely happens in practice (sometimes extra reactants are added to speed up a reaction)

Limiting Reactant: the reactant that runs out first. When used up, the reaction stops.

Ex 1.   1 frame + 2 wheels $\rightarrow$ 1 bike

a) If I have 6 frames and 11 wheels, what is the limiting reactant?

b) How many bikes can I make?

Ex 2. If 7.26 g of KNO_3 is reacted with 9.50 g of Mg metal, what is the limiting reactant?

Ex 3. $Fe_2O_3 + 3CO \rightarrow 2Fe + 3O_2$
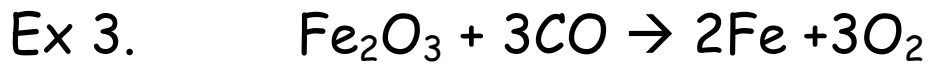
a) If 11.5 g of Fe_2O_3 reacts with 2.63 × 10^{24} molecules of CO, what mass of Fe is expected?

b) What mass of excess reactant is there?