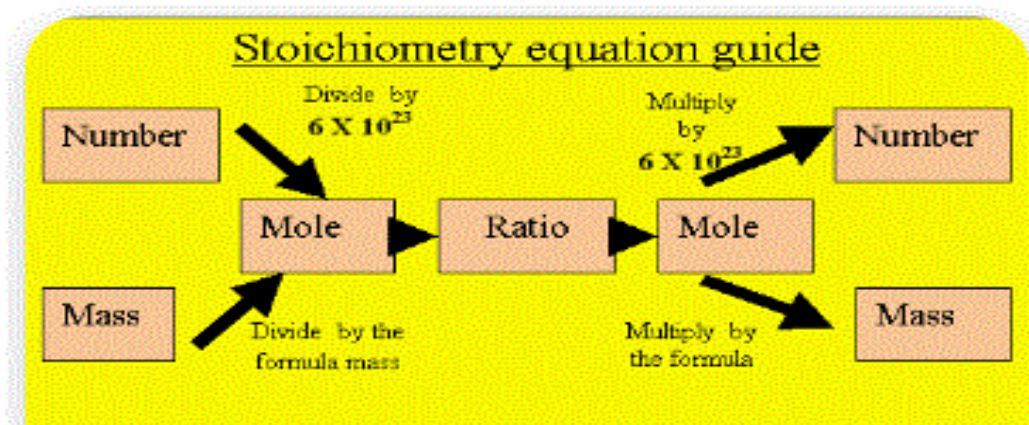


Stoichiometry



- 1) 2.30 grams of oxygen gas reacts completely in excess magnesium metal to form an ionic compound known as magnesium oxide (MgO) according to the chemical equation shown below.

Find the mass of magnesium metal needed to completely react with all the oxygen gas.

- 2) 10.73 grams of aluminium oxide (102 g/mol) is formed from the reaction between aluminium metal and oxygen gas according to the chemical equation shown below. Find the mass of aluminium needed.

- 3) Barium chloride reacts with sodium sulfate to form barium sulfate according to the reaction below. What volume, in mL, of a 0.132 M BaCl_2 solution is needed to exactly form 2.334 grams of BaSO_4 (233.40 g/mol)?
- 4) A chemist is provided with 200 mL of a 0.821 M aluminium sulfate ($\text{Al}_2(\text{SO}_4)_3$) solution and asked to remove all the aluminium from the sample. The chemist chooses to react the aluminium sulfate solution with sodium hydroxide, according to the equation below. What volume, in litres, of a 0.635 M NaOH should be used to completely precipitate all the aluminium (Al^{3+}) from the 200 mL aluminium sulfate sample?
- 5) Butane gas burns in oxygen according to the reaction shown below. What mass of water, in grams, is formed when exactly 6.400 grams of oxygen gas reacts completely with excess butane gas?
- 6) Butane gas burns in oxygen according to the reaction shown below. What number of water molecules are formed when exactly 12.8 grams of oxygen gas reacts completely with excess butane gas?