

THIS WEEKS HOMEWORK, PLUS LAST WEEKS FIX UP.....balanced chemical equations **DUE Fri 7th MARCH** pages 230-231 (I have worked solutions ready to go 29th Feb 2008)

EXERCISES

17 a Ethane (C_2H_6 , a minor constituent of natural gas) burns in oxygen to form carbon dioxide (CO_2) and water. How many moles of oxygen are needed to react with one mole of ethane? How many moles of:

i CO_2 **ii** water
are produced?

b Octane (C_8H_{18} , a constituent of petrol) burns in air to form CO_2 and H_2O . How many moles of oxygen are needed to react with 10 moles of octane and how many moles of water are produced?

18 a Nitrogen and hydrogen combine to form ammonia, NH_3 . How many moles of hydrogen are needed to form 40 moles of ammonia?

b Sulfur dioxide, SO_2 , reacts with oxygen to form sulfur trioxide, SO_3 . How many moles of oxygen are needed to form 0.6 mole of sulfur trioxide?

19 a What mass of zinc is formed when 0.2 mole zinc oxide reacts with excess carbon?

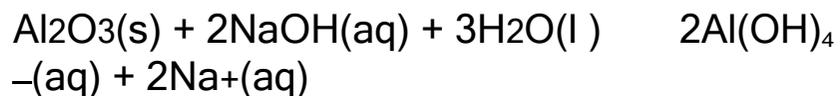
b What mass of magnesium hydroxide, $Mg(OH)_2$, is precipitated from solution when excess sodium hydroxide is added to a solution containing 0.050 mol magnesium ion? This reaction can be used to extract magnesium from sea water.

20 Calcium carbonate, $CaCO_3$, when heated decomposes to calcium oxide (CaO) and carbon dioxide. Calculate the mass of calcium oxide formed when 2.0 g calcium carbonate is decomposed.

21 What mass of hydrogen gas is produced when 1.3 g zinc reacts with excess hydrochloric acid, HCl? How much zinc chloride, ZnCl₂, is produced?

22 Sodium reacts with water to form hydrogen and sodium hydroxide solution. What mass of water is decomposed by 1.32 g sodium and what mass of hydrogen is formed?

23 The first step in extracting aluminium oxide from bauxite is to dissolve it in sodium hydroxide solution. The reaction is:



What mass of sodium hydroxide is needed to react with 12.7 g aluminium oxide?

24 To extract copper from cuprite, Cu₂S, the ore is roasted in air: copper and sulfur dioxide form. What mass of sulfur dioxide is produced per tonne of copper by this reaction?