2 11.5 6 14 2 2

$a C_3H_7NO_2S + b O_2 \longrightarrow d CO_2 + e H_2O + f NO_2 + g SO_2$

C : $3a = d$

H : $7a = 2e$

O : $2a + 2b = 2d + e + 2f + 2g$

N : $a = f$

S : $a = g$

$a = g = f$

$a = \frac{2}{7} e$

$a = \frac{d}{3}$

$2a + 2b = 2d + e + 2f + 2g$

$2a + 2b = 2(3a) + (3.5a) + 2a + 2a$

$2a + 2b = 13.5a$

$2b = 13.5a - 2a = 11.5a$

$b = \frac{11.5}{2} a$

Let $a = 2$

$b = 11.5$

$$\overset{1}{a}\,C_5H_{10} + \overset{5}{b}\,O_2 \longrightarrow \overset{5}{d}\,CO + \overset{5}{e}\,H_2O$$

$5a = d = e$

C : $5a = d$

H : $10a = 2e \Rightarrow 5a = e$

O : $2b = d + e$

$2b = 2e$

$b = e$

$a = 1$

$d = 5a = 5(1) = 5$

$e = 5$

$b = 5$

Let's say

$e = 1, \quad a = 1/5$

Hw Problem

$$\overset{2}{a}\,KMnO_4 + \overset{16}{b}\,HCl \rightarrow \overset{2}{c}\,KCl + \overset{2}{d}\,MnCl_2 + \overset{8}{e}\,H_2O + \overset{5}{f}\,Cl_2$$

K : $a = c$

Mn : $a = d$

O : $4a = e$ $\quad a = \frac{e}{4}$

H : $b = 2e$

Cl : $b = c + 2d + 2f$

assume

$e = 8$, $a = \frac{e}{4} = \frac{8}{4} = 2$

$f = 5$ $\quad a = d = 2 = c$

$2e = c + 2d + 2f$

$2e = d + 2d + 2f$

$2e = 3d + 2f$

$= 3(a) + 2f$

$2e = 3\frac{e}{4} + 2\frac{f}{1}$

$2e = \frac{3e + 8f}{4}$

$8e = 3e + 8f$

$5e = 8f$

Enthalpy 21 Sep Chem AS Developing fuels

reactions which liberate energy: exothermic
Ex: burning of wood

which need energy: endothermic
photosynthesis,
building up of muscles

H : enthalpy

$C + O_2 \rightarrow CO_2 \quad \Delta H = -$ in KJ/mol
↑ EXO

1 mol of C = 12 g

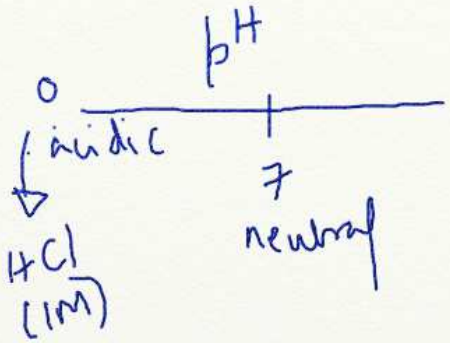
Endothermic

$CaCO_3 \xrightarrow{\Delta \text{ (heat)}} CaO + CO_2 \quad \Delta H = +?\ kJ/mol$

limescale

$CaO + H_2O \rightarrow Ca(OH)_2$

m = mass no.
n = moles



NaOH (1M) ↑ moles/dm^3

Logarithm (log) henrifaro@hotmail.com

$8 = 2^{x} = 2^{3}$

$\log_2 8 = ? \; 3$

2 ↑ base

$\log_2 2 = 1$

$2^{x} = 2$

$-\log_{10} 1 = 0$

$pH = 0$

$pH = -\log [H^+]$

$= -\log [1]$

1M HCl → $H^+ Cl^-$

$HCl \xrightarrow{H_2O} H^+ + Cl^-$

1M 1M 1M