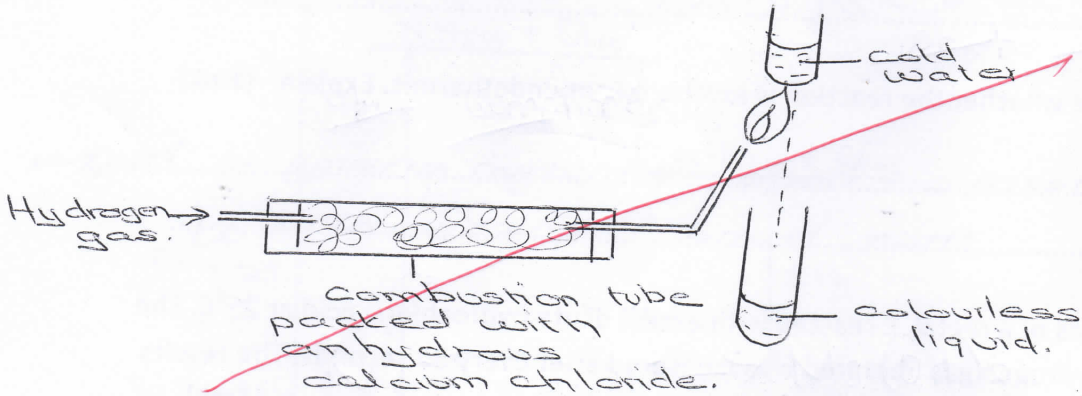12. The diagram below shows the set-up used to burn hydrogen and collect the product.

(a) Why is hydrogen not readily used as a fuel? (1mk)

It's explosive when mixed with air and ignited.

(b) State one uses of hydrogen gas. (1mk)
- Manufacture of NH_3 / HCl
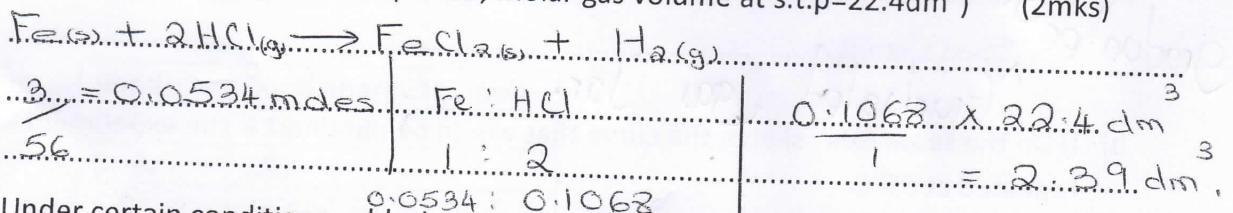- Hardening of oils
- ~~Reed~~ Rocket fuels

13. a) State Charles' Law. (1mk)

The volume of a *fixed* ~~given~~ mass of a gas is directly proportional to its absolute temp. at constant pressure.

b) A certain mass of a gas occupies 150cm³ at 281K and 109.41kPa. What will be its temperature if its volume is reduced by 16 cm³ at ~~1Q1.325kPa~~ 101.325. (2mks)

$$\frac{281 \times 134 \times 101.325 \, kPa}{150 \times 109.41 \, kPa} = 232.5 \, K.$$

14. 3g of iron reacted with hydrogen chloride gas at S.T.P. Calculate the volume of the hydrogen chloride gas used. (Fe=56, Molar gas volume at s.t.p=22.4dm³) (2mks)

$Fe_{(s)} + 2HCl_{(g)} \longrightarrow FeCl_{2(s)} + H_{2(g)}$

$\frac{3}{56} = 0.0534$ moles

Fe : HCl	0.1068 × 22.4 dm³
1 : 2	1
0.0534 : 0.1068	= 2.39 dm³

15. Under certain conditions, chlorine gas reacts with sodium hydroxide to form sodium hypochlorite.

a) Name the conditions under which sodium hydroxide reacts with chlorine to form sodium hypochlorite. (1mk)

Dilute NaOH

Cold NaOH.

b) State one use of sodium hypochlorite. (1mk)

Used for ....

Bleaching agent