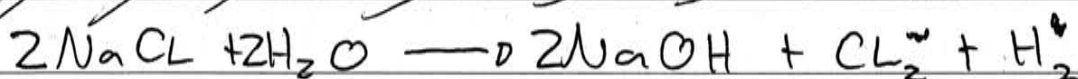
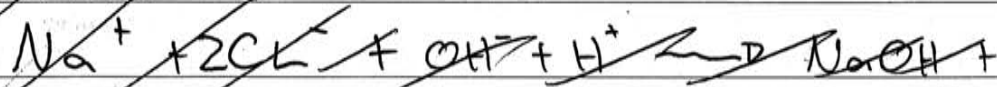


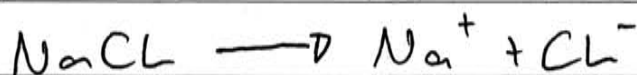
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a) Mercury Cell.

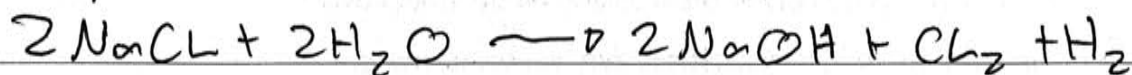
Brine (NaCl) is pumped into the cell (usually sourced from salt water from the sea; cheap). The anode in this cell is mercury which runs down a small slope as a liquid. The cathode is Platinum plates positioned close to the running mercury. This cell works as an ~~original~~ ^{electrolytic} cell, and is used ~~to~~ ~~water~~ ~~is~~ ~~reduced~~ used in the production of sodium hydroxide (NaOH).

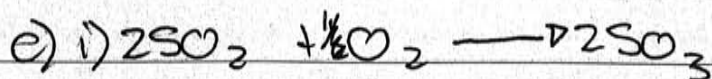


b) Molten sodium chloride is electrolysed with the absence of H_2O , \therefore so doesn't form NaOH .



Aqueous sodium chloride is $\text{NaCl} + \text{H}_2\text{O}$, and so forms NaOH , when NaCl is split into Na^+ & Cl^- , & H_2O is split into OH^- & H^+ .





$$K = \frac{[SO_3]^2}{[SO_2]^2 [O_2]}$$

~~K = 9~~

$$K = \frac{[0.03]^2}{[0.05]^2 [0.04]}$$

$$K = 9$$

$2SO_3$	- 0.3 moles
$2SO_2$	- 0.5 moles
O_2	- 0.4 moles

$2SO_3$	- 0.015 M	0.03 M
$2SO_2$	- 0.025 M	0.05 M
O_2	- 0.04 M	

ii) One of the conditions that affects the equilibrium would be changed, eg (temp, pressure etc) In this case, the rise in yield of SO_3 could have been caused by an increase in pressure. (3 moles : 2 moles) so equilibrium moves to right to compensate for increase in pressure. But because the total moles of the equilibrium cannot change, ~~there~~ the rise in yield of SO_3 , is proportional to the decrease in yield of SO_2 .

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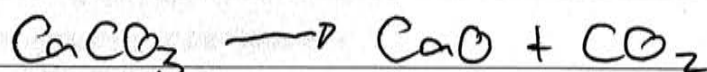
d) (i) Saponification

A - alkanoic acid. (alcohol)

(ii) By adding an oil (eg olive oil, vegetable oil) with an alcohol in an evaporating basin. ~~the~~ A catalyst is used (H_2SO_4), and the mixture is heated until it turns solid. Goggles need to be worn to protect the eyes from spilling substance (acid). Gloves should be worn when handling the end product, and when combining substances, as H_2SO_4 is a strong acid. Hair must be tied back as to prevent it lighting on fire. Equipment must not be touched until sufficient cooling time has passed.

e) CaCO_3 is an important substance in the production of the Solvay process. Limestone is a good source of CaCO_3 , and is relatively pure in its natural state. Limestone is an abundant substance on earth, and so is very cheap. However, the process to break down CaCO_3 requires a lot of energy (heat energy). As well as this, the mining of limestone can have devastating effects on the environment. During the mining process the top layer of vegetation (above the source of limestone) needs to be cleared. This can be huge areas, which may be home to a range of plants and animals. Not only this,

after mining occurs, the geography of that natural habitat changes. The mining process & the transportation of the heavy stone also used a lot of energy, and the combustion of fossil fuels.



~~Also~~

Also, CaO can be harmful to the environment. It is a waste product in the Sduay process, and is usually dumped into the ocean or lakes, which can ~~have a bad~~ effect the natural habitat of these aquatic areas.

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