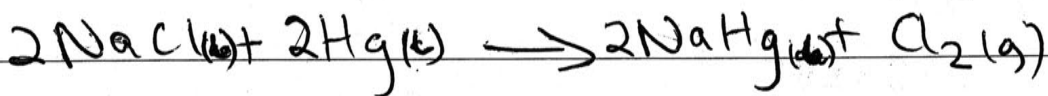
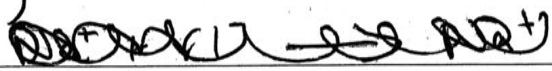


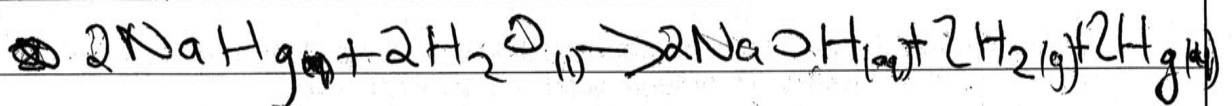
- red cat - 1 -

Start here.

a) Mercury ~~cell~~ <sup>cell</sup>. NaCl brine enters the ~~first~~ first chamber ~~for~~ for the mercury cell where the ~~sodium~~ sodium forms an amalgam with the mercury cathode. The chlorine is now a gas and is removed.

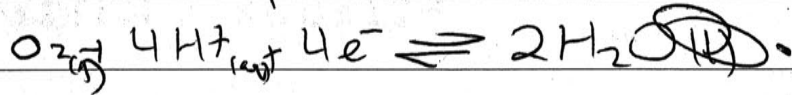


The ~~sodium~~ sodium amalgam is then sent to a different vat where it is reacted with water. The amalgam is decomposed and the sodium reacts with the water to ~~form~~ produce NaOH with Hydrogen gas released. The Mercury is then sent to a new vat where it is cooled down (by a coolant such as water in this case) and pumped back to the first vat where it is used again as the cathode to form an amalgam with the sodium.



b) ~~molten sodium chloride produces~~

The molten sodium chloride ~~and~~ and aqueous sodium chloride both produce chlorine at the anode. The difference between the two is basically the reaction that occurs at the cathode. For molten sodium chloride ~~the~~ oxygen is produced at the cathode ~~where~~ where the aqueous sodium chloride produces water ~~where~~.



Molten NaCl =

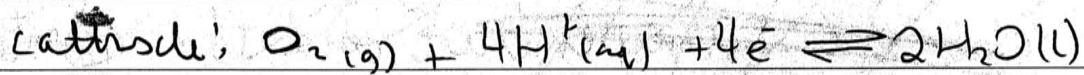


cathode: Na

overall:

Aqueous NaCl =

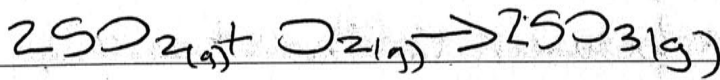
anode:



overall:

$$K = \frac{P}{R}$$

	SO <sub>2</sub>	O <sub>2</sub>	SO <sub>3</sub>
1	0.8	0.8	0
C	0.3	0.3	0.3
E	0.5	0.5	<del>0.3</del>



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

$$= \frac{0.3^2}{0.5^2 \cdot 0.5}$$

$$= \frac{0.09}{0.125}$$

$$K = 0.72$$

(11) ~~Because at time A the reaction was not yet at equilibrium. This must be the case because the only factor which can change is temperature and the question had stated that~~

A new equilibrium was established because the concentrations of the products and reactants changed, Although K kept constant.

You may ask for an extra Writing Booklet if you need more space.

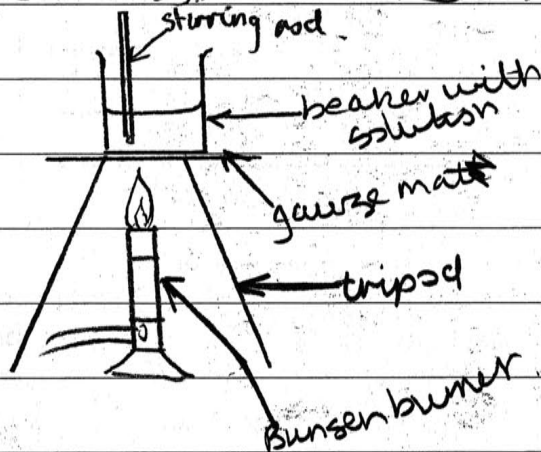
Start here.

d) (i) saponification  
A = NaOH

(ii) In a school laboratory this reaction could be followed out as follows:

1) Add about equal amounts of NaOH and an oil such as olive oil in a ~~beaker~~ beaker.

2) Put this solution over a Bunsen burner, i.e.



3) Stir this solution constantly, adding boiling chips to help boil evenly and ~~add~~ adding water if it starts to dry out.

~~Put the solution in~~  
4) Once solution has gone cloudy, take about 20ml of water & 20ml of oil & add about 10ml of each to ~~the~~ two test tubes.

~~Adding soap to one and leaving the other. Shake each test tube, water-oil solution and the one with~~

the soap inside should have emulsified the water oil liquid where ~~it~~ in the ~~oil~~ other, the oil and ~~the~~ water should have separated out again ~~to~~ to their individual layers.

e) Limestone in the solway process is very important. It provides the carbonate ~~into~~ in the final product and is used to recycle the ammonia ~~to~~ - which without this recycling, would have the costs of production much higher than the profit.

Limestone is easily ~~is~~ extracted for use in the solway process but still ~~has~~ has the associated environmental costs associated with mining, like cave formations where the limestone was, which can lead to collapsing.

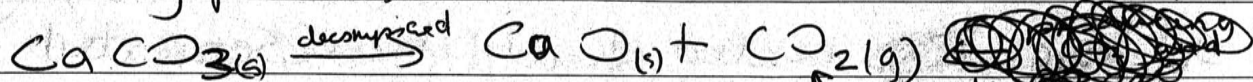
In the solway process, the limestone is required to be broken down using heat. This heat released becomes thermal pollution, This is very bad for the environment due to its ability to decrease the <sup>resolved</sup> oxygen content of the water from which the underwater inhabitants need to survive.

~~Limestone's use in the~~ The solway process could not be done without the use of the Limestone.

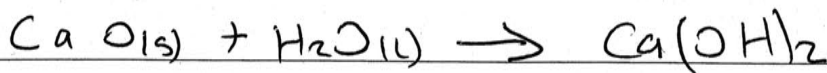
For example, these are the reactions in which

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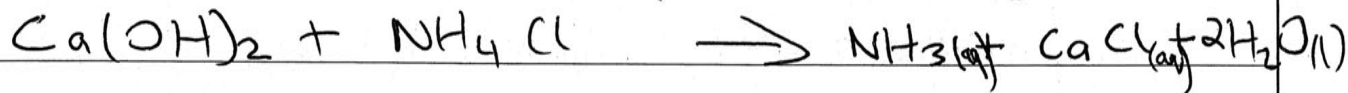
...limestone and its products are used as in the  
solway process -



CO<sub>2</sub> reacts  
later to form  
CaCO<sub>3</sub>



ammonia  
recovery



You may ask for an extra Writing Booklet if you need more space.