Membrane cell is used to extract sodium hydroxide. Brine water goes through the cell and turns into sodium amalgam. The sodium amalgam gets decomposed into sodium hydroxide. Throughout the cell there is a pump that gets in water which then gets converted by hot water by the cooler.

(b) Aqueous sodium chloride is reacted

Aqueous sodium chloride is dissolved with water. Sodium amalgam when enters the decomposes dissolved with water when Brine enters the membrane cell it gets electrolysed and chlorine comes out, leaving the sodium which then reacts with the hydroxide ions present in the cell.

\[
\begin{align*}
\text{Na}^+ & \quad \text{Na}^+ + e^- \\
(\text{Br}) & \quad \text{Cl}^- \\
\text{Overall} & \quad \text{Na}^+ + \frac{1}{2} \text{Cl}_2 & \rightarrow \text{Na}^+ + \text{Cl}^- \\
\end{align*}
\]

(c) \[2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3\]

\[
\begin{align*}
k & = \frac{[\text{SO}_3]^2}{[\text{SO}_2][\text{O}_2]} \\
& = \frac{(0.5)^2}{(0.3)^2(0.4)} = 6.94.
\end{align*}
\]
B because the volume was reduced which caused the molecules to collide and then the reaction was faster. Therefore a new equilibrium is reached since the 0.4 moles of O₂ are used up.
(a) This is a condensation reaction. 

\[ COOH \overset{\text{NaOH}}{\overset{\text{CH}_3}{\rightarrow}} \text{CH}_3 \]

(b) Use a specific volume of oil and heat it with a bunsen burner with glycerol. Heat it until its yellow incolour for about fifteen minutes. Then place the solution in a cold bath until it becomes solid. Drain off the liquid and remove all mixture and place it on a sheet of paper. This will dry it out and it looks like a soap. Safety goggles are to be worn to avoid splashes. Hair needs to be tied back, so it will not catch fire from the bunsen burner. Control heating is to be done to avoid the over flowing of the solution. Constant stirring is to be done, so it won't clump together.

(c) Solvay process is very important process for the production of sodium carbonate. Sodium carbonate is then used to make glass. This process requires the use of limestone with sodium chloride.

\[ CaCO_3 + 2NaCl \rightarrow CaCl_2 + Na_2CO_3 \]

Using limestone will cause environmental
Impact: When limestone is used it could cause soil degradation.