ai) The process produce soap from fat and acid is called saponification.

ii) Soap is highly polar and so can "stick" to many different substances. Also, it breakes the viscosity of water. Therefore grease can be easily removed in soap water. It has many contribute to the society.

b) $SO_2 = 0.06\ mol\ L^{-1}$ $S = 32.07 + O_2 = 16 \times 2 = 64.07g$

$O_2 = 0.05\ mol\ L^{-1}$ $32g$

$SO_3 = 0.04\ mol\ L^{-1}$ $= 64.07 + 16 = 80.07g$

$SO_2 + O_2 \rightleftharpoons SO_3$

$64.07 + 32 \rightleftharpoons 80.07$

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(c)(i) $H_2SO_4 + H_2O \rightleftharpoons H_3O^+ + HSO_4^-$

$HSO_4^- + H_2O \rightleftharpoons H_3O^+ + SO_4^{2-}$

(ii) Oxidising agent

$H_2SO_{4(aq)} + 2H^+_{(aq)} + 2e^- \longrightarrow 2H_2O_{(l)} + SO_{2(aq)}$

Dehydrating agent

$HCOOH_{(aq)} \xrightarrow{\text{heat with } H_2SO_4} H_2O_{(l)} + CO_{(g)}$

Precipitating sulfates

$H_2SO_4 + MgSO_4 \longrightarrow$

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d) i) Haber process

~~$NH_4 + H_2 \rightleftharpoons$~~

$N_2 + 4H_2 \rightleftharpoons 2NH_4$

Add N_2 ~~&~~ H_2 in a closed system to form NH_4

ii) the equilibrium was ~~at~~ analysed by adding catalyst. Increasing pressure at low temperature. to increase ~~the~~ NH_4. ~~quatit~~. forward & reverse reaction were equal (reached equilibrium) shows qualitative analysis.

~~e)~~

c) Sodium hydroxide is an important compound in today's society. It is primarily used as an alkaline, but it is also used in the production of a host of other chemical compounds.

The mercury cell production method for producing NaOH is gradually being phased out due to environmental concerns, primarily the leakage of a proportion of mercury into local seawater. One such plant at Botany Bay has already closed.

Newer methods of NaOH production are significantly more economical, environmentally friendly and efficient.