

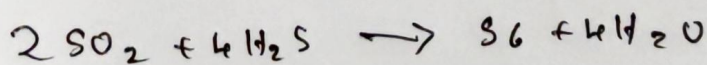
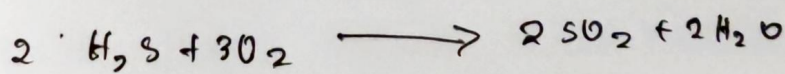
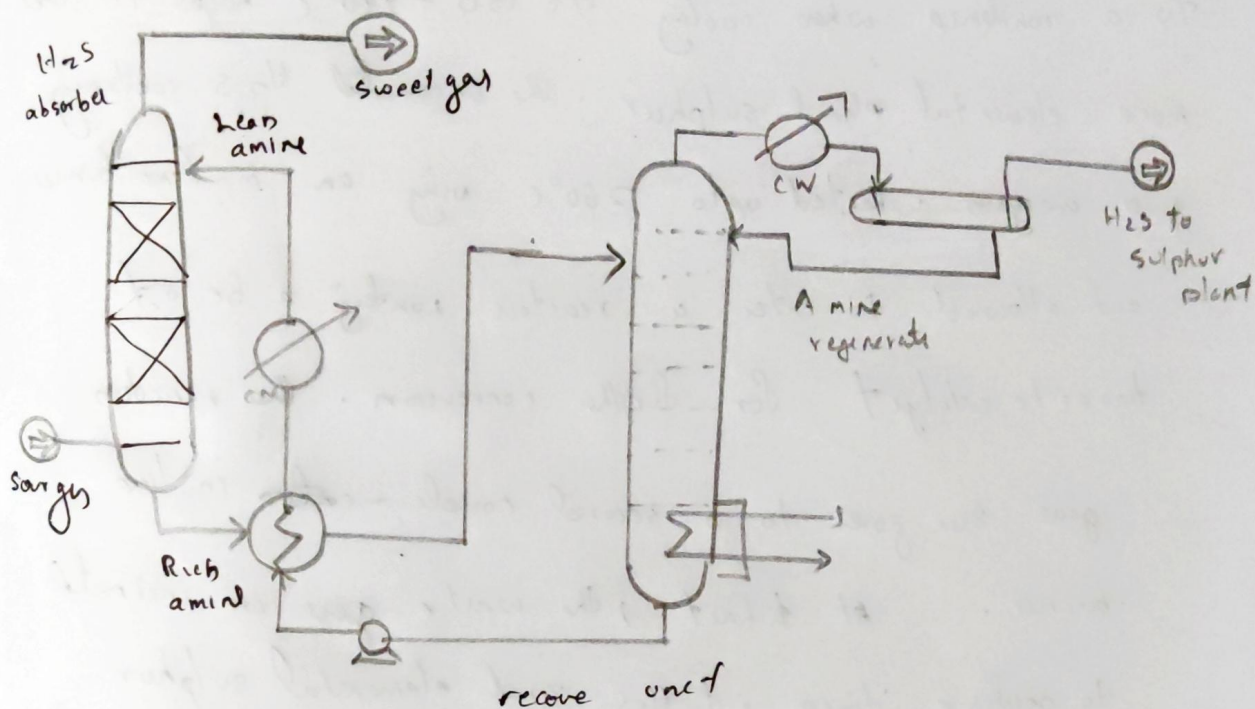
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## 2) Sulphur recovery

Refinery process give rise to large quantities of sour gas ( $\text{CO}_2$  and  $\text{H}_2\text{S}$ ) as by-product. Removal of  $\text{H}_2\text{S}$  from sour oil gas is normally achieved at high pressure by a counter-current absorption process using an alkaline solution. Monoethanolamine (MEA), Diethanolamine (DEA), Di-isopropanolamine (DIPA) etc may used for the process.

~~Class method~~ The most commonly used one is the Claus method, which makes use of the combustion of  $\text{H}_2\text{S}$  in a carefully controlled stream of air. A part of the  $\text{H}_2\text{S}$  thus gets oxidized to  $\text{SO}_2$ ,

which then reacts with a remaining  $\text{H}_2\text{S}$  to give elemental sulphur



$\text{H}_2\text{S}$  from the amine regenerate is mixed with just sufficient combustion air needed for the reaction and taken to the furnace. Due to the exothermic reaction, temperatures in excess of  $1200^\circ\text{C}$  are reached. This heat is recovered from the reaction zone to make high-pressure steam in the waste-heat boiler.  $\text{H}_2\text{S}$  gets converted to elemental sulphur at this stage.



The reaction gas coming out of the waste-heat boiler then goes to a condenser where cooling to  $150 - 140^{\circ}\text{C}$  helps to collect more elemental elemental sulphur. The uncondensed  $\text{H}_2\text{S}$  containing gases are then heated up to  $260^{\circ}\text{C}$  using an in-line burner

and allowed to enter a reactor containing a bed of bauxite catalyst for further conversion. The reaction

gas then goes to a second condenser - ~~in line~~ in line burner. At the last, the waste gas are incinerated to oxidise traces of  $\text{H}_2\text{S}$  and elemental sulphur