

## PRODUCTION OF ETHYL CHLORIDE USING RECYCLE STREAM

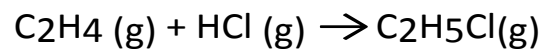
Malapati Sree Harsha

Sri Venkateswara University College Of Engineering

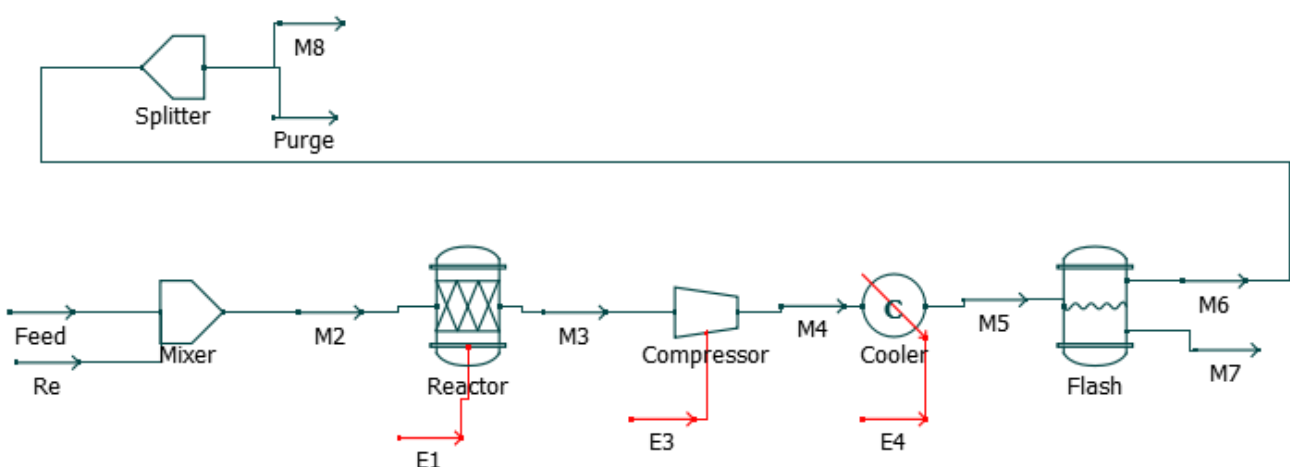
### INTRODUCTION:

Chloroethane, better known as ethyl chloride, is used in the production of tetraethyl lead, a gasoline additive. It is a colourless, flammable gas or refrigerated liquid, mainly employed as a chemical intermediate in solvents, aerosols, and anaesthesia. It is used as a blowing agent in foamed plastics, in the production of ethyl cellulose and acts as an ethylating agent in the manufacture of dyes, chemicals and pharmaceuticals. Earlier it was formed as a by product in vinyl chloride synthesis but presently it is exclusively manufactured for a number of applications [1].

The gas phase reaction of ethylene with hydrogen chloride to form chloroethane is an addition reaction. It proceeds with almost no by-products or side reactions and it has a high selectivity for the mono-chlorinated product (chloroethane). The chemical reaction is represented by the following equation:



### Flowsheet:



**Results:**

**DWSIM**

<b>FLOW RATE OF MATERIAL STREAMS(Mol/s)</b>				
<b>COMPOUNDS</b>	<b>FEED</b>	<b>REACTOR OUTLET(M3)</b>	<b>Flash TOP(M6)</b>	<b>Flash BOTTOM(M7)</b>
<b>ETHYL CHLORIDE</b>	0	23.653563	0.23676097	23.416803
<b>ETHYLENE</b>	24	0.90487747	0.90325253	0.0016247722
<b>HYDROGEN CHLORIDE</b>	25	1.655604	0.39623082	1.2593731
<b>NITROGEN</b>	1	1.94585	1.9419914	0.0034932574

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<b>COMPOUNDS</b>	<b>FEED</b>	<b>REACTOR OUTLET(M3)</b>	<b>Flash TOP(M6)</b>	<b>Flash BOTTOM(M7)</b>
<b>ETHYL CHLORIDE</b>	0	23.2858	0.157614	23.1218
<b>ETHYLENE</b>	24	0.882297	0.215245	0.677051
<b>HYDROGEN CHLORIDE</b>	25	1.95417	0.345777	1.60839
<b>NITROGEN</b>	1	1.88719	1.86701	0.0201832