

Recovery of Various Heavier Hydrocarbon(Propane,Iso-Butane,N-Butane) From Natural Gas Liquid(NGL) by Continuous Cryogenic Pressure Columns Successively.

Rishav Saraswat
Madhav Institute Of Technology And Science, Gwalior-
474005

Background and Description: **Natural Gases** are Gases which comes from our Nature. It is a Non-renewable of Energy.

Natural gas liquids (NGLs) are hydrocarbons—in the same family of molecules as **natural gas** and crude oil, composed exclusively of carbon and hydrogen. Ethane, propane, butane, isobutane, and pentane are all NGLs. There are many uses for NGLs, spanning nearly all sectors of the economy.

Natural Gas – **Natural gas** is a hydrocarbon gas. It consists primarily of methane but may also include other alkanes, carbon dioxide, nitrogen, and hydrogen sulfide. **Natural Gas Liquids** – **Natural gas liquids** are condensable hydrocarbons that are often associated with **natural gas** or crude oil.

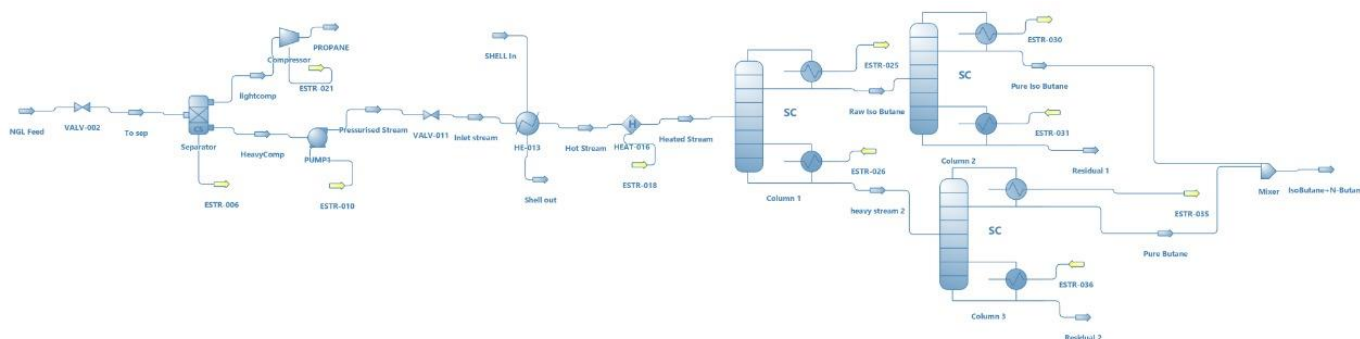
Process:

The recovery of valuable heavier hydrocarbons from natural gas is accomplished in a series of distillation columns. The first column is a cryogenic pressure column in which the methane is taken overhead and the ethane and heavier hydrocarbons are produced as a bottoms product called “natural gas liquid” (**NGL**).

Here, firstly we take NGL stream for the further process. We perform some process before going to Separator like for controlling purpose we use Valve. After the Separator operation, two stream is formed one is light vapour stream In which propane is taken out, another one is heavy material stream. Heavy material stream is going for further operations.

After some small operation, it goes to Column 1 in which Separation occur then their stream is also goes to another Columns like Column 2 and Column 3 for Separation by Distillation process. Then product comes from Column 2 and Column 3 is mix by mixer and form one Stream of Butane(iso-Butane + N-butane).

Flowsheet:



Results: Master property table for whole process-

Master Property Table							
Object	Raw Iso Butane	Pure Iso Butane	Pure Butane	PROPANE	NGL Feed	IsoButane+ N-Butane	
Temperature	-1.0883	-11.6423	1.52151	33.1994	15	-3.27613	C
Pressure	1.01325	1.01325	1.01325	6	3.8	1.01325	bar
Volumetric Flow	21.264	12.34	25.2035	3248.58	200	82.6994	m3/h
Molar Fraction (Mixture) / Ethane	0	0	0	0.021631	0.01	0	
Molar Fraction (Mixture) / Propane	0	0	0	0.930132	0.43	0	
Molar Fraction (Mixture) / Isobutane	0.592754	0.998935	0.031271	0.00302834	0.07	0.340059	
Molar Fraction (Mixture) / N-butane	4.60157E-10	6.75277E-10	0.840714	0.00519143	0.12	0.572433	
Molar Fraction (Mixture) / Isopentane	0.397257	0.001	0.0198486	0.00540774	0.05	0.0138338	
Molar Fraction (Mixture) / N-pentane	1.72683E-20	7.01162E-23	0.0982033	0.0043262	0.04	0.0668656	
Molar Fraction (Mixture) / N-hexane	0.01	5.39653E-11	0.01	0.0302834	0.28	0.00680889	

References- **Dryden's Outlines of Chemical Technology** for the 21st Century: Rao and M Gopala and Shreves **Chemical Process Industries Handbook** 5th Edition. Also from spoken tutorials from fossee project IIT Bombay.