MODELING OF GAS AND GAS CONDENSATE PREPARATION IN LOW-TEMPERATURE SEPARATION

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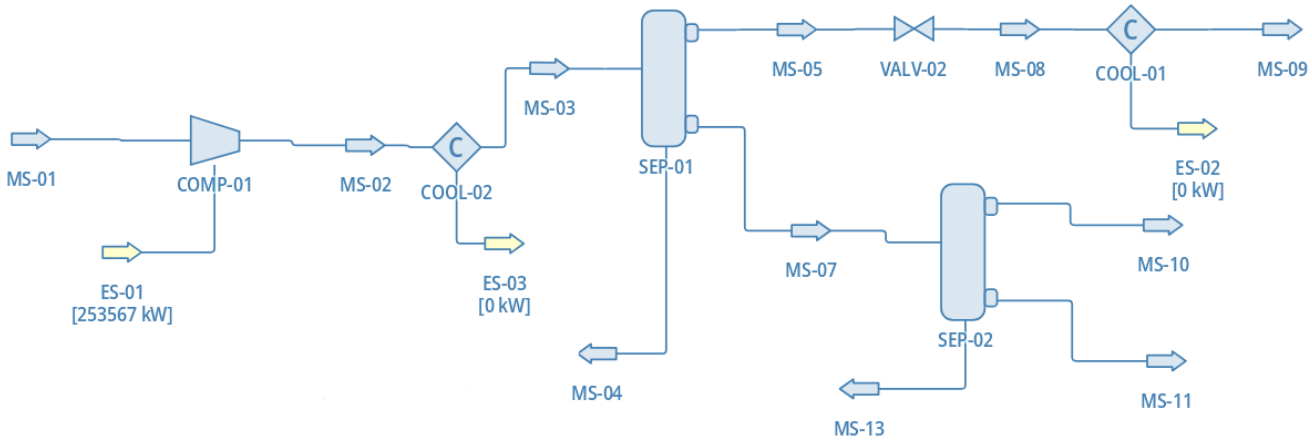
Background & Description:

This method and physical-chemical nature of gas from liquid hydrocarbons and water at low temperatures due to the Joule-Thompson effect separation.Low-temperature separation technology (LTS) is one of the most effective ways to prepare the gas to further its use as a fuel and raw material for chemical industry. The process flow sheet Simulation carried Peng-Ribnson Thermodynamics property.

The inlet gas temperature is equal to 15 ° C, the pressure is 7,082 MPa. The gas flow at the inlet to apparatus is 2070 t/day. The gas mixture is compressed to High pressure then cooled to low temperatures for separation with gas liquid separater.steady state (at constant pressure of 7,082 MPa, temperature of 15 °C, flow rate of gas at the inlet to apparatus of 2070 t/day, gas valve opening degree of 28%, liquid valve opening degree of 25%) separator performance remains unchanged (the gas flow from separator is 2004 t/day, flow rate of fluid from apparatus is 66 t/day), but when opening degree of control valves changes (both gas and liquid outlets) the transition from one steady-state of the separator to another begins.

Flowsheet:



GAS AND GAS CONDENSATE PREPARATION IN LTS

Results:

Object:	M-8	M-10	M-1	M-9	
Temperature	1326.73	1260.05	15	1326.73	C
Pressure	6727.9	7082	0.101325	6727.9	MPa
Mass Flow	2.07E+06	2.07E+06	2.07E+06	2.07E+06	kg/d
Molar Flow	45086.5	45086.5	45086.5	45086.5	kmol/d
Volumetric Flow	47.1024	47.0816	34712.2	47.1024	m3/h
Density (Mixture)	1831.12	1831.92	2.48471	1831.12	kg/m3
Molecular Weight (Mixture)	45.9117	45.9117	45.9117	45.9117	kg/kmol
Specific Enthalpy (Mixture)	10389.8	10389.8	-193.882	10389.8	kJ/kg
Specific Entropy (Mixture)	2.33136	2.09821	-0.0916056	2.33136	kJ/[kg.K]
Molar Enthalpy (Mixture)	477013	477013	-8901.44	477013	kJ/kmol
Molar Entropy (Mixture)	107.037	96.3326	-4.20577	107.037	kJ/[kmol.K]
Thermal Conductivity (Mixture)	0.233272	0.219686	0.053684	0.233272	W/[m.K]

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Reference:

https://www.researchgate.net/publication/286789712_MODELING_OF_GAS_AND_GAS_CONDENSATE_PREPARATION_UNIT_MODES_IN_LOW-TEMPERATURE_SEPARATION_TECHNOLOGY