200 AREA

OXYHYDROCHLORINATION

In the oxyhydrochlorination section, air (oxygen source), ethylene, and hydrogen chloride are fed in near stoichiometric amounts to a fluidized bed reactor to react and form ethylene dichloride (EDC) (The official scientific name is 1,2-dichloroethane). The incoming hydrogen chloride (HCl) has passed through a hydrogenator to convert any acetylene to ethylene and ethane. The HCL also passes through preheaters to raise the temperature of the feed gasses to reaction temperature. The feeds then react in the presence of a catalyst to form EDC. The reaction is cooled by circulating condensate from a steam drum through cooling coils in the reactor. Heat energy in the form of steam is recovered from the reaction in the steam drum.

The hot gases from the reactor flow to the hot quench column where they are cooled by direct contact with water. Any corrosive HCl is also removed. The cooled gases then flow through a condenser (TT-206) where approximately 80% of the EDC is condensed. The condensate collects in a decanter where EDC forms the heavy layer which is sent to the crude storage.

The gases from the liquid decanter pass through a glycol chiller (TT-207) to further condense EDC (Approx. 15%). The condensed liquid drains back to the decanter. The exit gas stream from the chiller then contains about 5% of the EDC formed in the reactor. This EDC is scrubbed from the gas using Aromatic 150 in an absorber column. The EDC rich A-150 is then stripped in a vacuum column (Stripper) and the recovered EDC is pumped back to the EDC decanter. The lean A-150 (A-150 with no EDC) is pumped through heat exchangers back to the absorber column to repeat the process of absorbing EDC from the vent gasses.

The OC reactor is also equipped with a catalyst hopper. The purpose of this hopper is to store catalyst, transfer catalyst to and from the reactor. The catalyst hopper is equipped with a steam ejector to pull a vacuum and a cyclone to recover catalyst from vent gases.

Make a process flow diagram of the 200 area using a P&IDfor reference. Show control valve locations and learn the function of the area and each major piece of equipment.

The following is a list of 200 area equipment names and corresponding numbers:

	NAME:	NUMBER:
1.	Hydrogen K.O. Pot	GY-217
2.	Hcl Hydrogenator Heater	TP-202
3.	HCL Hydrogenator	MR-201
4.	HCL Preheater	TP-203
5.	Ethylene Preheater	TP-204
6.	Reactor Air Compressor	PC-201
7.		Catalyst Hopper Ejector PE-203
8.	Catalyst Storage Hopper	MB-202
9.		Catalyst Stg Hopper Cyclone GJ-203
10.	Purge Air Heater	TP-205
11.	OC Reactor	MR-203
12.	Reactor Steam Drum	MS-204
13.	Hot Quench Column	AS-201
14.	Crude EDC Condenser	TT-206

15. Crude EDC Decanter MS-205
16. Absorber Feed Chiller TT-207
17. Absorber Feed Separator MS-206
18. Absorber AS-202
19. Cyclone Separator GY-209
20. Kerosene Cooler TT-210
21. Kerosene Chiller TT-209
22. Kerosene Exchanger TT-211A/B/C
23. OC Emergency Vent K/O Pot GY-201
24. Stripper AS-203
25. Stripper Reboilers TT-212A/B
26. Stripper Condenser TT-213
27. Condenser KO Pot GY-213
28. Vacuum Pump KO Pot GY-218
29. Vacuum Pump Cooler TT-222
30. Seal Liquid Cooler TT-221
31. **PUMPS:**

* Reactor Coolant Pump PP-202A/B
* Recycle Water Pump PP-205
* Crude EDC Product Pump PP-206A/B
* Stripper Reb Circ. Pump PP-216
* Kerosene Pump PP-209A/B
* Stripper Reflux Pump PP-210
* Stripper Vac. KO Pot Pump PP-203
* Stripper Vacuum Pump PP-218A/B