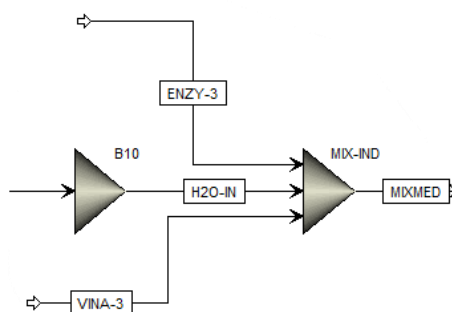


Etap	Nombre del proceso	Equipos principales	Objetivo principal
1	Mezcla inicial	MIX-IND	Mezclar de manera correcta la vinaza y el agua.
2	Producción de PHB en biorreactor	Biorreactor (CTF1-IND)	Fermentación microbiana para formación de PHB
3	Extracción con cloroformo e hipoclorito	Centrífuga 1	Solubilizar PHB y separarlo de residuos por diferencia de densidad
4	Filtración de biomasa	Filtro industrial	Separar sólidos celulares remanentes
5	Recuperación de hipoclorito	Sistema de membranas	Separar y reutilizar hipoclorito del medio acuoso
6	Precipitación del PHB con isopropil	Mezclador + Centrífuga 2	Precipitar PHB como sólido desde cloroformo con isopropil
7	Purificación y recuperación de solventes	Columna de destilación	Recuperar cloroformo e isopropil para su reutilización

Etap 1.



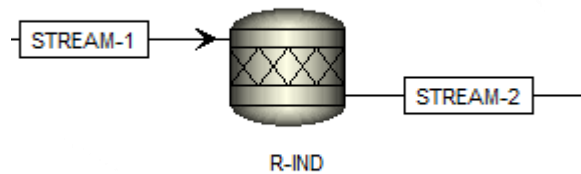
		ENZY-3	H2O-IN	VINA-3	MIXMED
MASS FLOWS	kg/hr	53,8342974	377,61849	26,8402395	458,293027
COA-SH	kg/hr	1,18989862	0	0	1,18989862
NADPH	kg/hr	3,41741161	0	0	3,41741161
WATER	kg/hr	0	369,310883	25,0454312	394,356314
DEXTR-01	kg/hr	0	8,30760678	0,22279661	8,53040339
NAD+2	kg/hr	49,2269872	0	0	49,2269872

L-GLU-01	kg/hr	0	0	0,20564184	0,20564184
GLYCE-01	kg/hr	0	0	0,39415584	0,39415584
FUMAR-01	kg/hr	0	0	0,34274537	0,34274537
L-LAC-01	kg/hr	0	0	0,3255906	0,3255906
CALCI-01	kg/hr	0	0	0,01318949	0,01318949
MAGNE-01	kg/hr	0	0	0,01424626	0,01424626
SODIU-01	kg/hr	0	0	0,03045847	0,03045847
ETHANOL	kg/hr	0	0	0,24598385	0,24598385

		ENZY-3	H2O-IN	VINA-3	MIXMED
VOLUMEN FLOW	cum/hr	0,01315	0,37863	0,02736	0,41961

$$[\text{Concentración Dextrosa}] = \frac{\text{Flujo másico dextrosa}}{\text{Flujo volumetrico}} = \frac{8,30760678}{0,41961} = 19,80 \text{ kg/m}^3$$

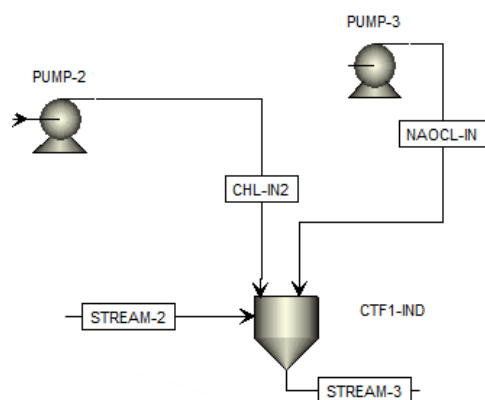
Etapas 2.



		STREAM-1	STREAM-2
MASS FLOWS	kg/hr	458,293027	458,293027
COA-SH	kg/hr	1,18989862	1,18989862
NADPH	kg/hr	3,41741161	0,09001448
NADP+	kg/hr	0	3,30312389
PHB-SOL	kg/hr	0	1,25353868
WATER	kg/hr	394,356314	394,139392
DEXTR-01	kg/hr	8,53040339	3,89300655
CO2	kg/hr	0	1,05984545
NADH2	kg/hr	0	32,05066
NAD+2	kg/hr	49,2269872	17,2734202
L-GLU-01	kg/hr	0,20564184	0,20564184
GLYCE-01	kg/hr	0,39415584	0,39415584

FUMAR-01	kg/hr	0,34274537	0,34274537
L-LAC-01	kg/hr	0,3255906	0,3255906
CALCI-01	kg/hr	0,01318949	0,01318949
MAGNE-01	kg/hr	0,01424626	0,01424626
SODIU-01	kg/hr	0,03045847	0,03045847
ETHANOL	kg/hr	0,24598385	0,24598385
BIOMASSC	kg/hr	0	2,46811526

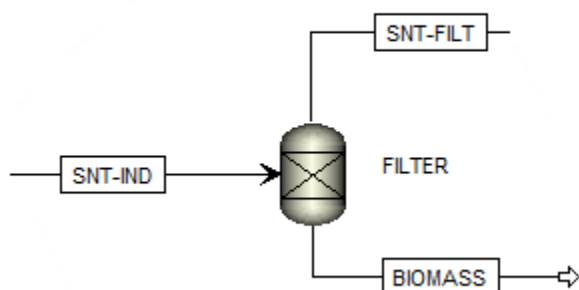
Etapa 3.



		CHL-IN2	NAOCL-IN	STREAM-2	STREAM-3
MASS FLOWS	kg/hr	653,567568	421,950815	458,293027	1533,81239
COA-SH	kg/hr	0	0	1,18989862	1,18989862
NADPH	kg/hr	0	0	0,09001448	0,09001448
NADP+	kg/hr	0	0	3,30312389	3,30312389
PHB-SOL	kg/hr	0	0	1,25353868	1,25353868
WATER	kg/hr	15,9928499	389,509001	394,139392	799,642273
DEXTR-01	kg/hr	0	0	3,89300655	3,89300655
CO2	kg/hr	0	0	1,05984545	1,05984545
NADH2	kg/hr	0	0	32,05066	32,05066
NAD+2	kg/hr	0	0	17,2734202	17,2734202
L-GLU-01	kg/hr	0	0	0,20564184	0,20564184
GLYCE-01	kg/hr	0	0	0,39415584	0,39415584
FUMAR-01	kg/hr	0	0	0,34274537	0,34274537
L-LAC-01	kg/hr	0	0	0,3255906	0,3255906
CALCI-01	kg/hr	0	0	0,01318949	0,01318949
MAGNE-01	kg/hr	0	0	0,01424626	0,01424626
SODIU-01	kg/hr	0	0	0,03045847	0,03045847
ETHANOL	kg/hr	0	0	0,24598385	0,24598385

BIOMASSC	kg/hr	0	0,0503697	2,46811526	2,51848496
ISOPR-01	kg/hr	19,686361	0	0	19,686361
CHLOR-01	kg/hr	617,888357	0	0	617,888357
HIPOCHLO	kg/hr	0	32,3914444	0	32,3913964

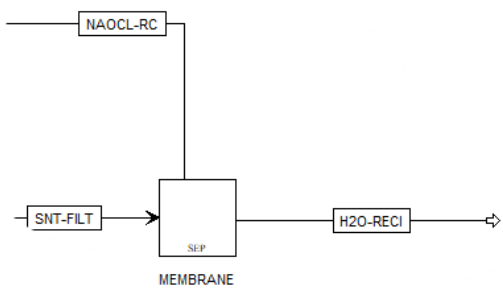
Etapa 4.



		SNT-IND	BIOMASS	SNT-FILT
MASS FLOWS	kg/hr	904,86907	128,608175	776,260894
COA-SH	kg/hr	1,18989862	1,18989862	0
NADPH	kg/hr	0,09001448	0,09001448	0
NADP+	kg/hr	3,30312389	3,30312389	0
PHB-SOL	kg/hr	0,01253539	0,01253539	0
WATER	kg/hr	783,649428	39,1824714	744,466956
DEXTR-01	kg/hr	3,89300655	3,89300655	0
CO2	kg/hr	1,05984545	1,05984545	0
NADH2	kg/hr	32,05066	32,05066	0
NAD+2	kg/hr	17,2734202	17,2734202	0
L-GLU-01	kg/hr	0,20564184	0,20564184	0
GLYCE-01	kg/hr	0,39415584	0,39415584	0
FUMAR-01	kg/hr	0,34274537	0,34274537	0
L-LAC-01	kg/hr	0,3255906	0,3255906	0
CALCI-01	kg/hr	0,01318949	0,01318949	0
MAGNE-01	kg/hr	0,01424626	0,01424626	0
SODIU-01	kg/hr	0,03045847	0,03045847	0
ETHANOL	kg/hr	0,24598385	0,24598385	0
BIOMASSC	kg/hr	2,51848496	2,46811526	0,0503697
ISOPR-01	kg/hr	19,686361	19,686361	0
CHLOR-01	kg/hr	6,17888357	6,17888357	0

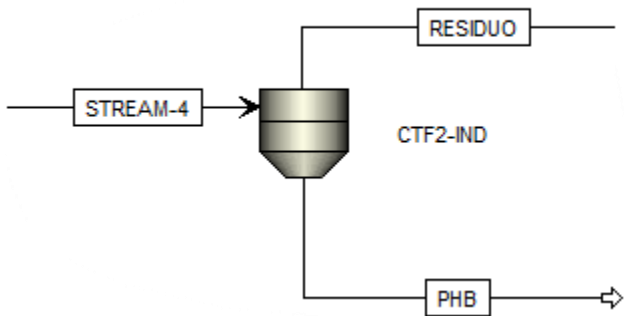
HIPOCHLO	kg/hr	32,3913964	0,64782793	31,7435685
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Etapla 5.



		SNT-FILT	H2O-RECI	NAOCL-RC
MASS FLOWS	kg/hr	776,260894	381,132053	395,128841
WATER	kg/hr	744,466956	377,957696	366,50926
BIOMASSC	kg/hr	0,0503697	0	0,0503697
HIPOCHLO	kg/hr	31,7435685	3,17435685	28,5692117

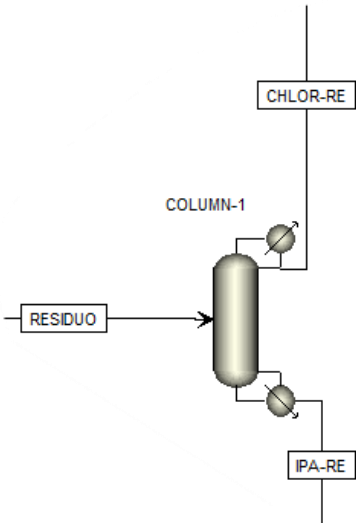
Etapla 6.



		STREAM-4	PHB	RESIDUO
MASS FLOWS	kg/hr	963,837327	1,2410033	962,596323
PHB-SOL	kg/hr	1,2410033	1,2410033	0
WATER	kg/hr	16,6019518	0	16,6019518

ISOPR-01	kg/hr	328,106016	0	328,106016
CHLOR-01	kg/hr	617,888356	0	617,888356

Etapa 7.



		RESIDUO	CHLOR-RE	IPA-RE
MASS FLOWS	kg/hr	962,596323	647,388683	315,2076436
WATER	kg/hr	16,6019518	15,9928499	0,609106345
ISOPR-01	kg/hr	328,106016	19,686361	308,419655
CHLOR-01	kg/hr	617,888356	611,709472	6,17888225