Electronic Supplementary Material

Determination of a suitable index for a solvent via two-column extractive distillation using a heuristic method

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Table S1. The binary interaction parameters of toluene-methanol.

Component.i	Toluene	Toluene	Methanol	Toluene	Methanol	Toluene	Methanol	Toluene	Methanol	Toluene	Methanol	Toluene	Methanol	Toluene	Methanol
Component.j	Methanol	NMP	NMP	Aniline	Aniline	C4H9NO	C4H9NO	Styrene	Styrene	o-xylene	o-xylene	p-xylene	p-xylene	m-xylene	m-xylene
Source	AVP72 VLE-IG	AVP72 VLE-IG	R-PCES	AVP72 VLE-IG	AVP72 VLE-IG	R-PCES	R-PCES	R-PCES	R-PCES	R-PCES	R-PCES	AVP72 VLE-IG	AVP72 VLE-IG	AVP72 VLE-IG	AVP72 VLE-IG
A_{ij}	0.0	0.4132	0.0	0.9547	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5285	0.0	0.0
A_{ji}	0.0	-0.5048	0.0	-0.3418	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3930	0.0	0.0
B_{ij}	-563.01	-44.826	54.436	-435.76	88.414	4.1403	37.355	-563.01	54.436	-13.344	40.331	24.560	247.46	151.33	37.758
B_{ji}	27.831	171.516	-60.116	110.26	-291.40	41.595	-66.675	27.831	-60.116	14.081	-606.05	-20.761	-1511.5	-235.89	-609.38
C_{ij}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C_{ji}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D_{ij}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D_{ji}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E_{ij}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E_{ji}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TLOWER	336.65	363.25	298.15	313.15	293.15	298.15	298.15	336.65	298.15	298.15	298.15	384.38	313.15	383.730	337.80
TUPPER	383.75	436.85	298.15	427.05	338.15	298.15	298.15	383.75	298.15	298.15	298.15	410.25	411.45	412.290	412.15

Table S2. The binary interaction parameters of acetone-methanol.

Component.i	Methanol	Acetone	Methanol	Methanol	Acetone	Methanol	Acetone	Methanol	Acetone	Methanol	Acetone	Methanol	Acetone
Component.j	Acetone	Water	Water	MEA	MEA	EG	EG	DMSO	DMSO	DMF	DMF	Ethanol	Ethanol
Source	AVP72 VLE-IG	AVP72 VLE-IG	APV72 VLE-IG	R-PCES	R-PCES	AVP72 VLE-IG	AVP72 VLE-IG	AVP72 VLE-IG	AVP72 VLE-IG	APV72 VLE-IG	APV72 VLE-IG	APV72 VLE-IG	AVP72 VLE-IG
A_{ij}	0	6.3981	-0.693	0	0	33.3298	0	0	0	-0.703	0	4.7119	-0.3471
A_{ji}	0	0.0544	2.7322	0	0	0.1753	0	0	0	1.1467	0	-2.3127	-1.0787
B_{ij}	114.13	-1808.99	172.99	-1050.5	599.61	-10000	386.73	30.5966	167.14	301.44	-17.224	-1162.3	206.59
B_{ji}	101.88	419.971	-617.27	2751.9	-98.522	-322.92	236.85	-331.16	39.842	-400.24	-5.1717	483.84	479.05
C_{ij}	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0	0	0.3	0.3
C_{ji}	0	0	0	0	0	0	0	0	0	0	0	0	0
D_{ij}	0	0	0	0	0	0	0	0	0	0	0	0	0
D_{ji}	0	0	0	0	0	0	0	0	0	0	0	0	0
E_{ij}	0	0	0	0	0	0	0	0	0	20	20	0	0
E_{ji}	0	0	0	0	0	0	0	0	0	152.5	152.9	0	0
TLOWER	55	20	24.99	25	25	40	50	20	25	0	0	20	25
TUPPER	64.65	95.1	100	25	25	199	50	40	45	0	0	78.4	78.3

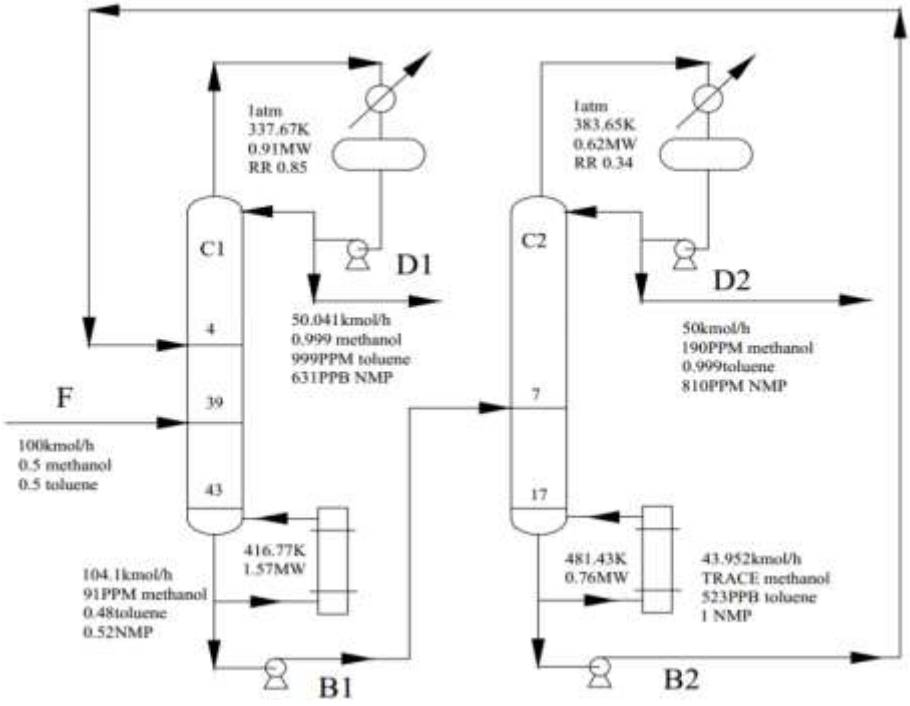

Figure S1. The flowsheet information with NMP as entrainer

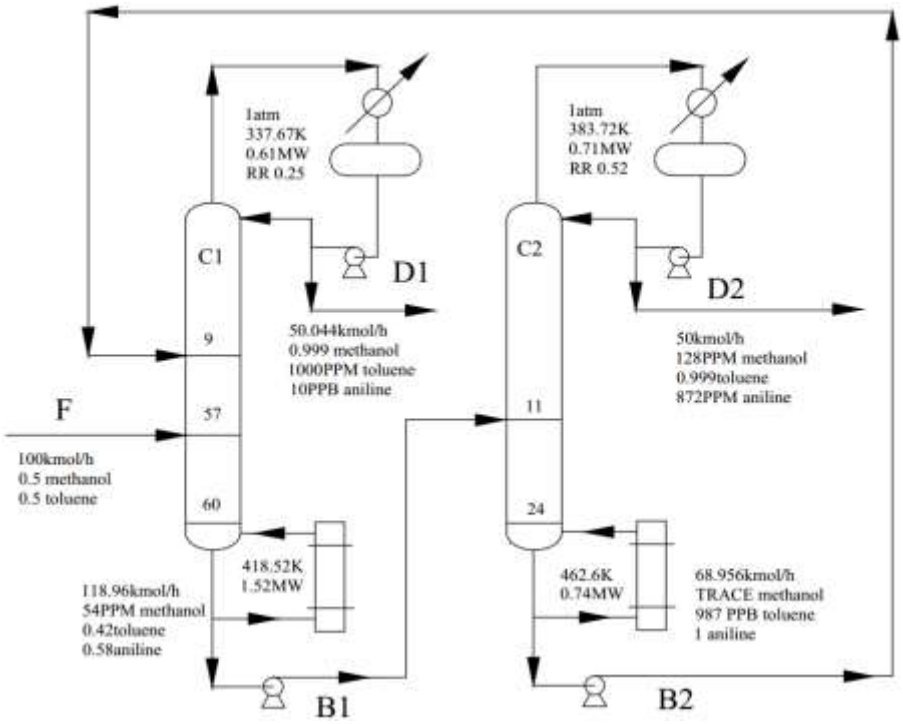

Figure S2. The flowsheet information with aniline as entrainer

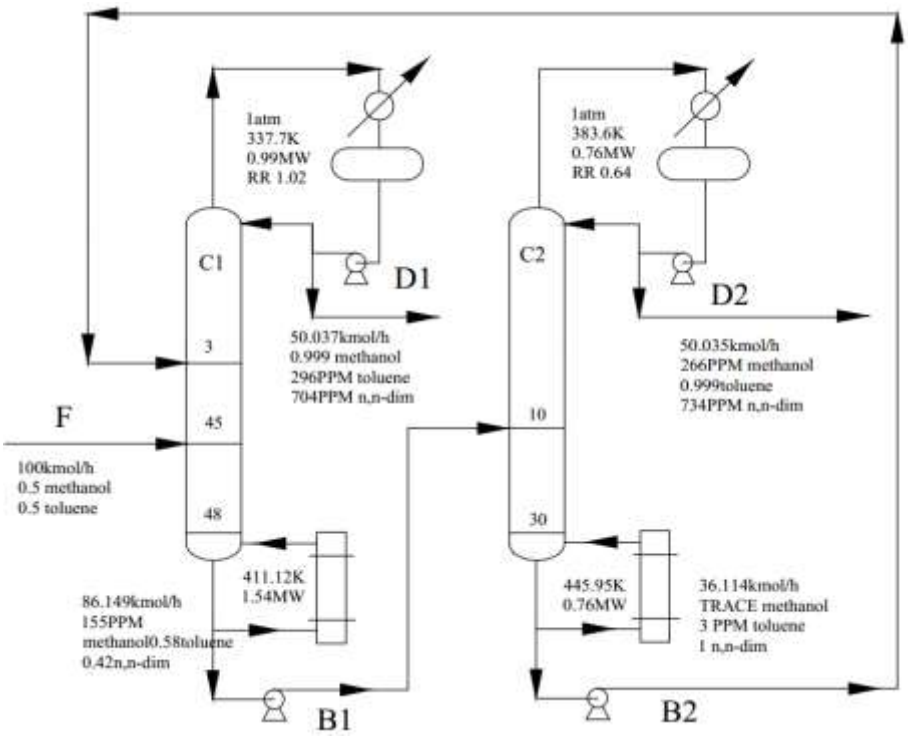

Figure S3. The flowsheet information with N,N-dimethylacetamide as entrainer

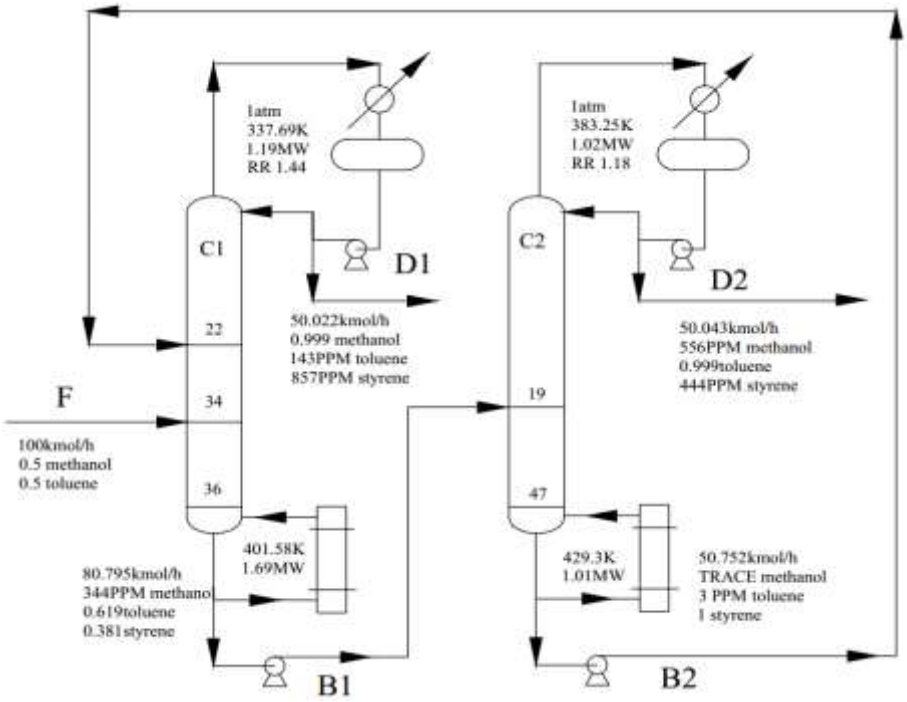

Figure S4. The flowsheet information with styrene as entrainer

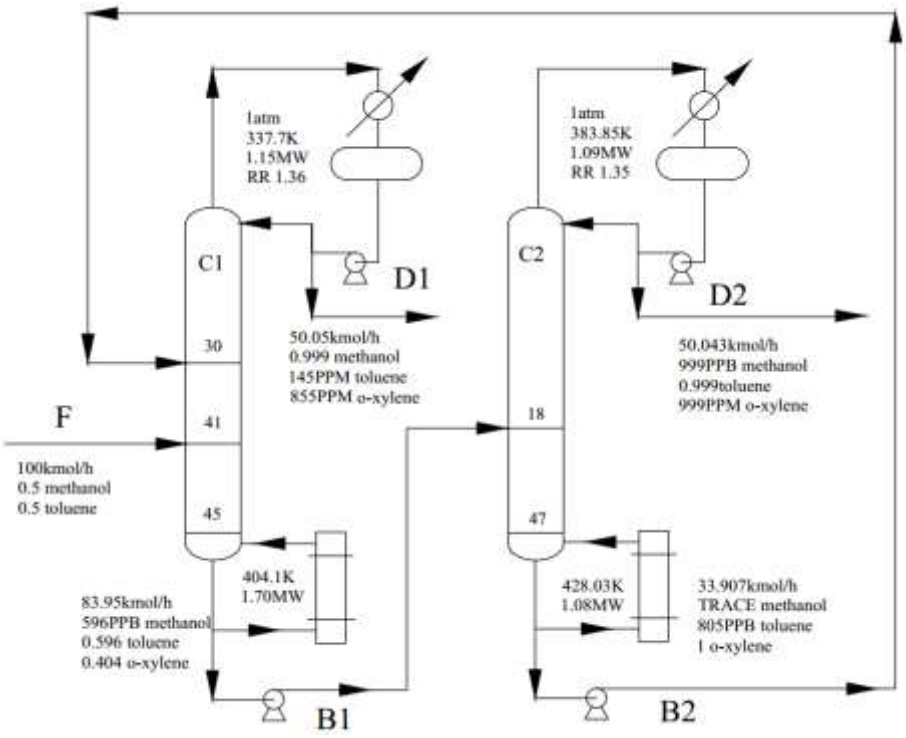

Figure S5. The flowsheet information with o-xylene as entrainer

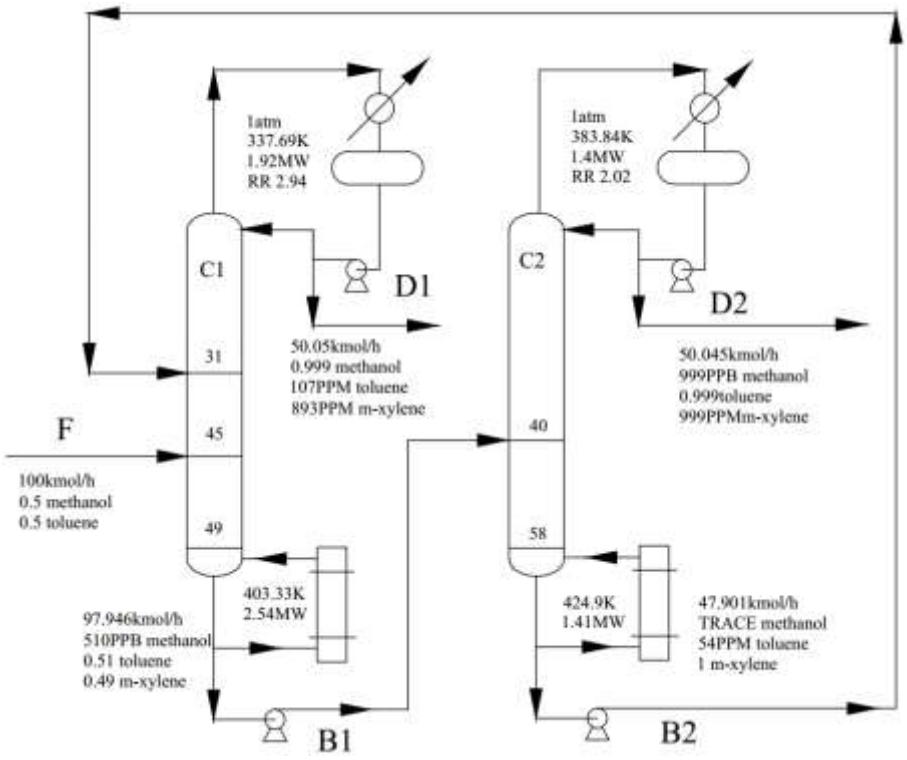

Figure S6. The flowsheet information with m-xylene as entrainer

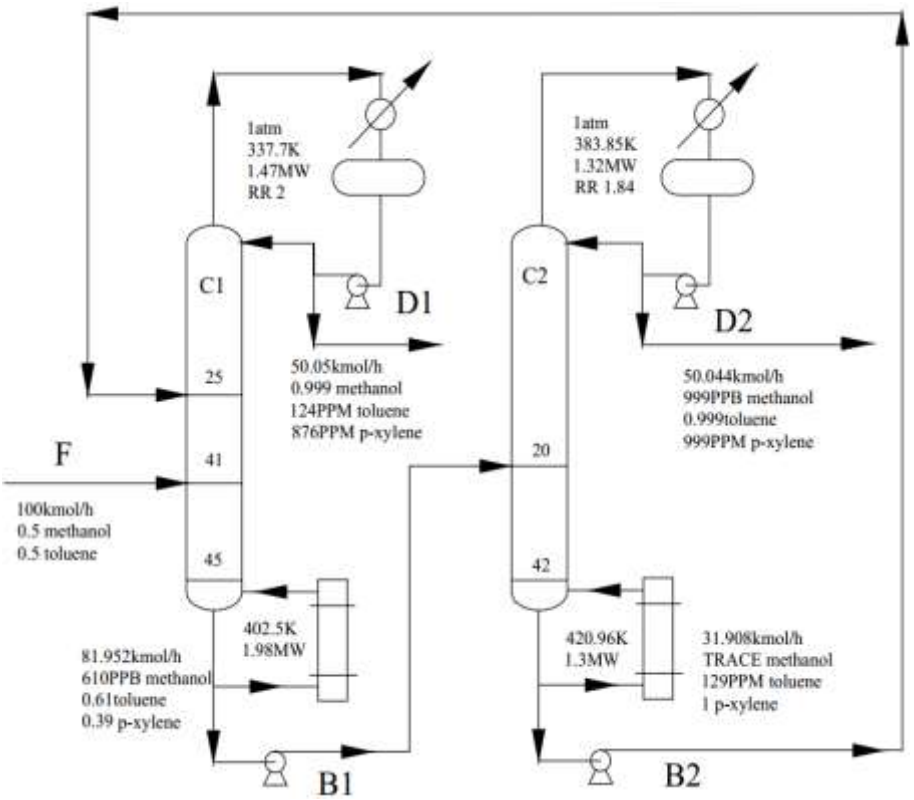

Figure S7. The flowsheet information with p-xylene as entrainer

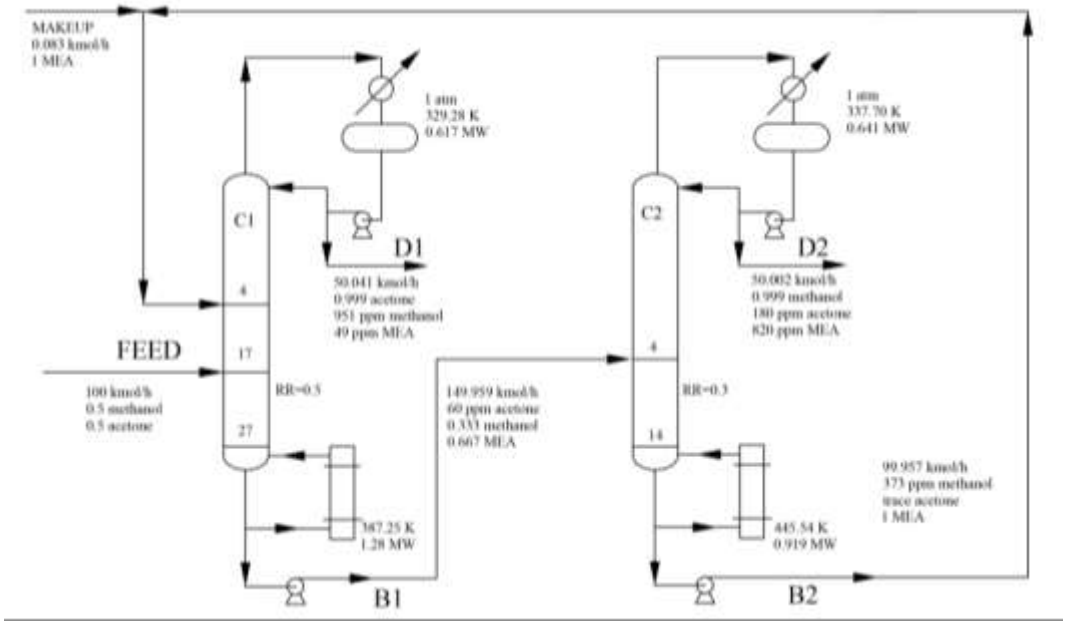

Figure S8. The flowsheet information with MEA as entrainer

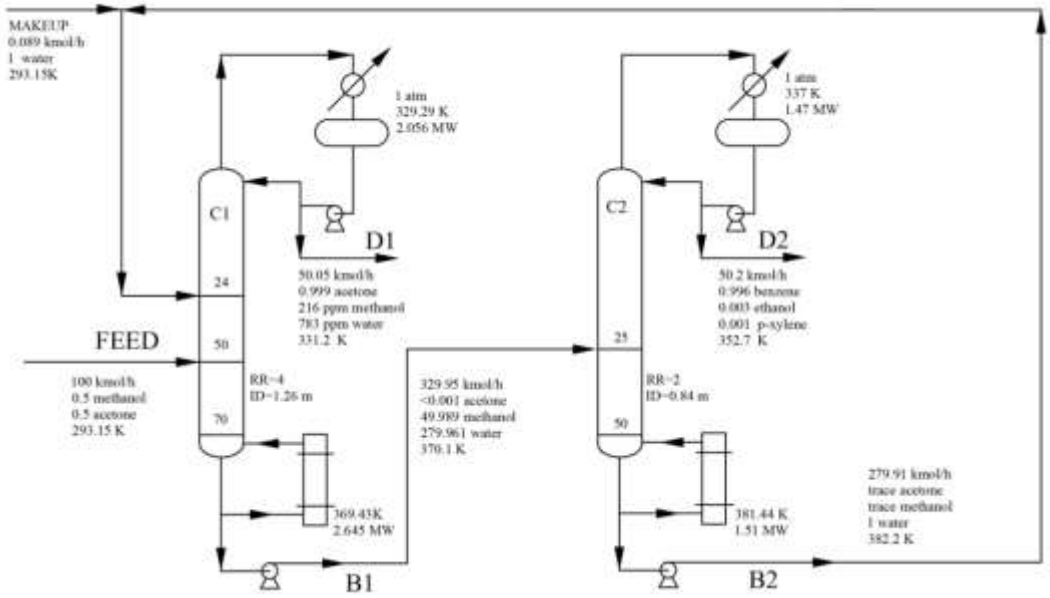

Figure S9. The flowsheet information with Water as entrainer

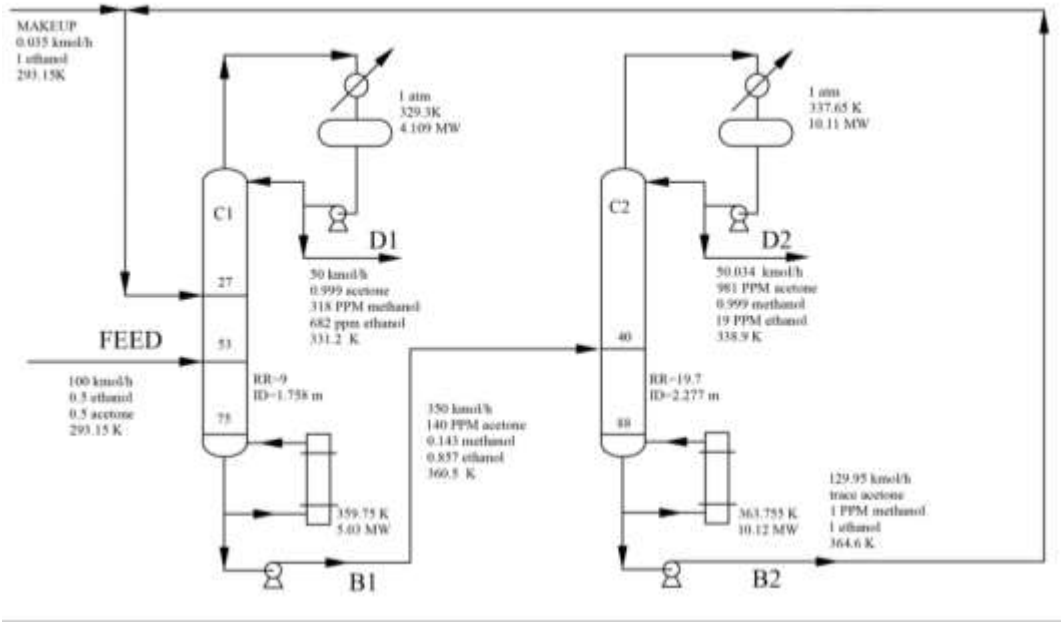

Figure S10. The flowsheet information with Ethanol as entrainer

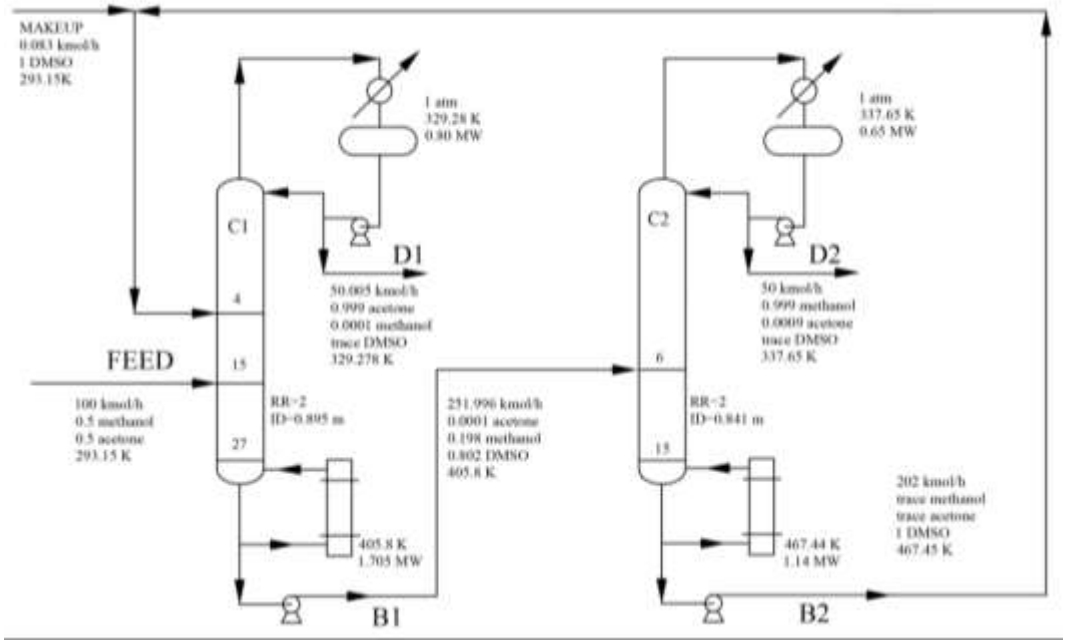

Figure S11. The flowsheet information with DMSO as entrainer

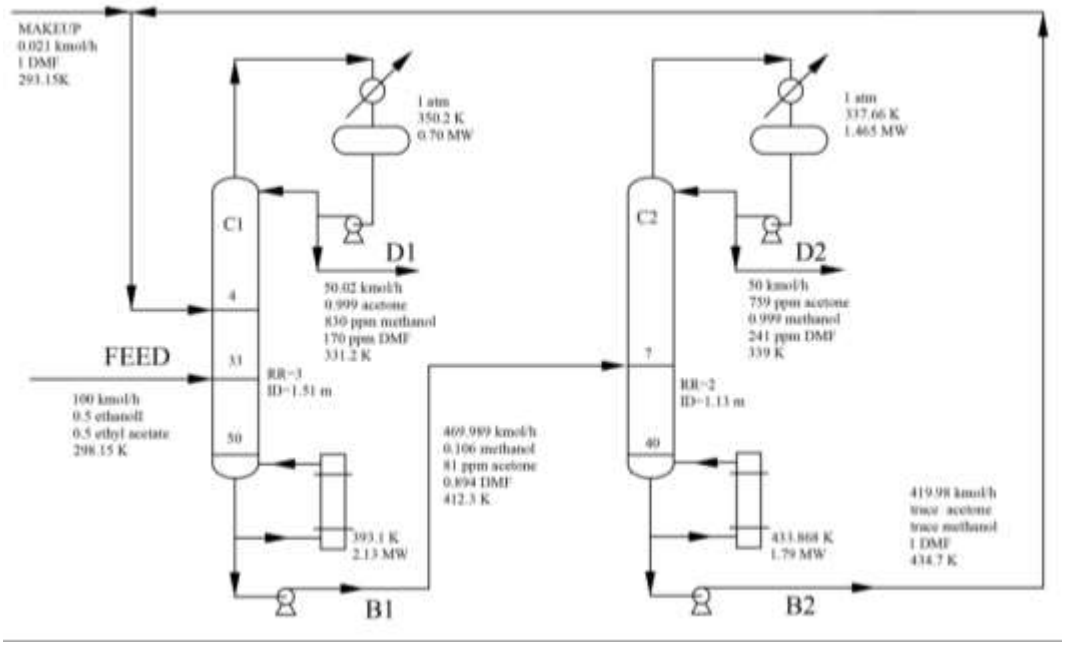

Figure S12. The flowsheet information with DMF as entrainer