Vapor Liquid Equilibrium (VLE)

1. Excel을 이용한 풀이(기체흐름의 분율과 액체흐름의 조성)

1단계 – 스프레드시트 입력하기

	A	B	C	D	E	F	G	H
1			*v*=	0.425837				
2			Phase					
3			Equilibrium	term1 =	term2 =	Ratio =		
4		*zi*	*k*-value	(*ki* - 1)*zi*	(*ki*-1)*v*+1	term1/term2	*xi*	*yi*
5	Propane	0.1000000	6.8000000	0.5800000	3.4698546	0.1671540	0.0288197	0.1959736
6	*n*-Butane	0.3000000	2.2000000	0.3600000	1.5110044	0.2382521	0.1985434	0.4367956
7	*n*-Pentane	0.4000000	0.8000000	-0.0800000	0.9148326	-0.0874477	0.4372385	0.3497908
8	*n*-Octane	0.2000000	0.0520000	-0.1896000	0.5963065	-0.3179573	0.3353980	0.0174407
9		1.0000000			*f(v)*=		0.9999995	1.0000006
10								

1. Excel을 이용한 풀이(기체흐름의 분율과 액체흐름의 조성)

2단계 – D1를 변화시켜 F9의 값이 0이 되게 하기

F9 | =F5+F6+F7+F8

	A	B	C	D	E	F	G	H
1			*v*=	0.425846257				
2			Phase					
3			Equilibrium	term1 =	term2 =	Ratio =		
4		*zi*	*k*-value	(*ki* - 1)*zi*	(*ki*-1)*v*+1	term1/term2	*xi*	*yi*
5	Propane	0.1000000	6.8000000	0.5800000	3.4699083	0.1671514	0.0288192	0.1959706
6	*n*-Butane	0.3000000	2.2000000	0.3600000	1.5110155	0.2382504	0.1985420	0.4367923
7	*n*-Pentane	0.4000000	0.8000000	-0.0800000	0.9148307	-0.0874479	0.4372393	0.3497915
8	*n*-Octane	0.2000000	0.0520000	-0.1896000	0.5962977	-0.3179620	0.3354029	0.0174410
9		1.0000000			*f(v)*=	-0.0000081	1.0000034	0.9999954
10								
11								
12								
13								
14								
15								
16								
17								

목표값 찾기 상태

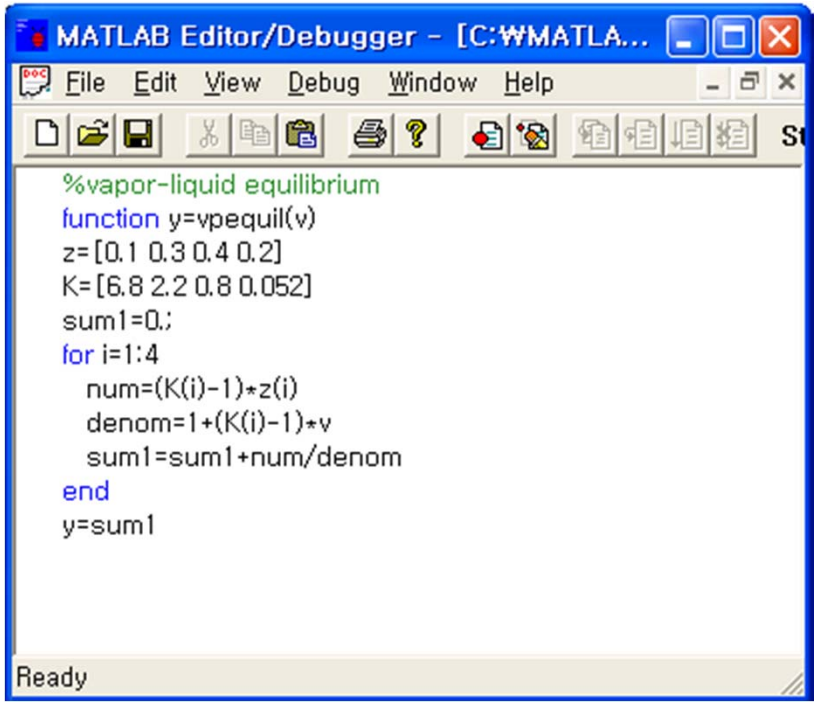
셀 F9에 대한 값 찾기
답을 찾았습니다.

목표값: 0
현재값: -0.0000081

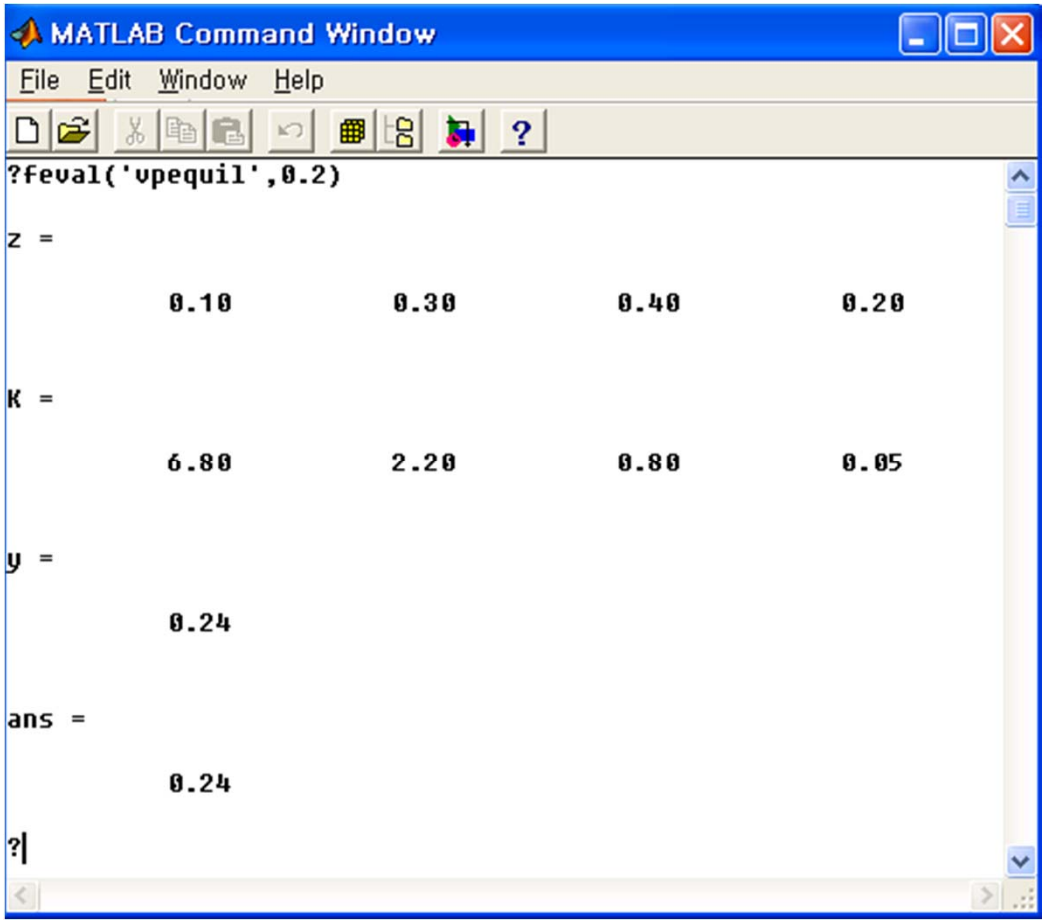
단계(S) | 일시 중지(P) | 확인 | 취소

2. MATLAB을 이용한 풀이(기체흐름의 분율과 액체흐름의 조성)

1단계 – vpequil.file 만들기

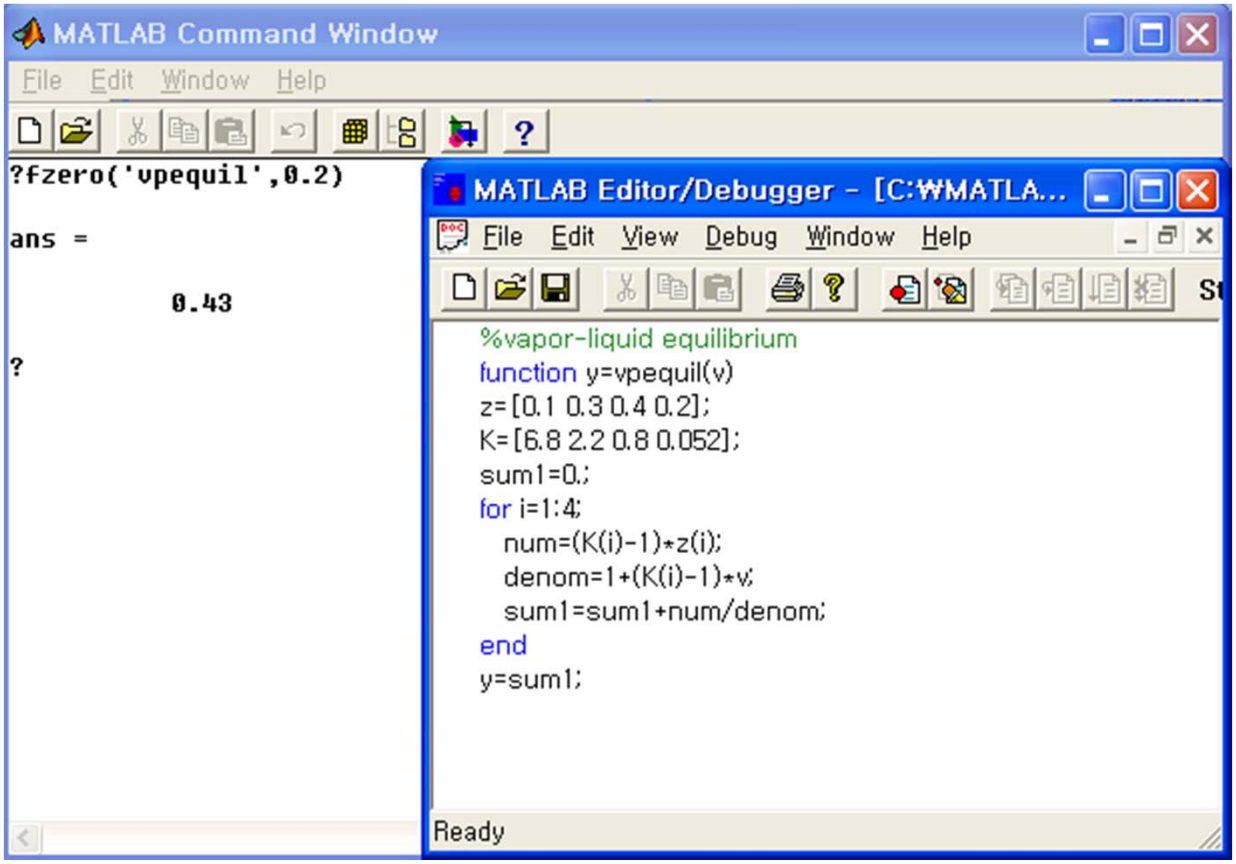


2단계 – vpequil(0.2) 실행하기



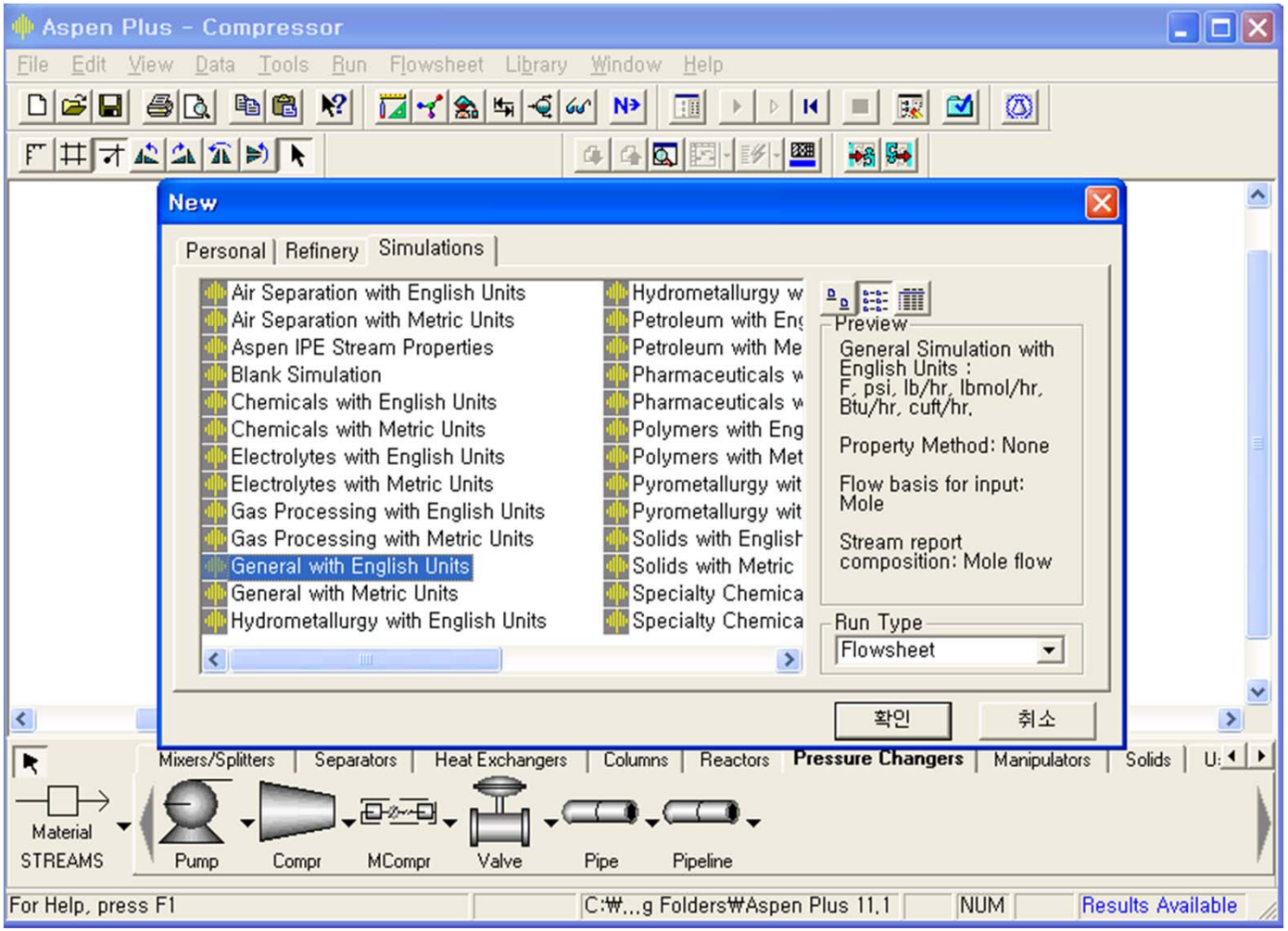
2. MATLAB을 이용한 풀이(기체흐름의 분율과 액체흐름의 조성)

3단계 – fzero 구하기



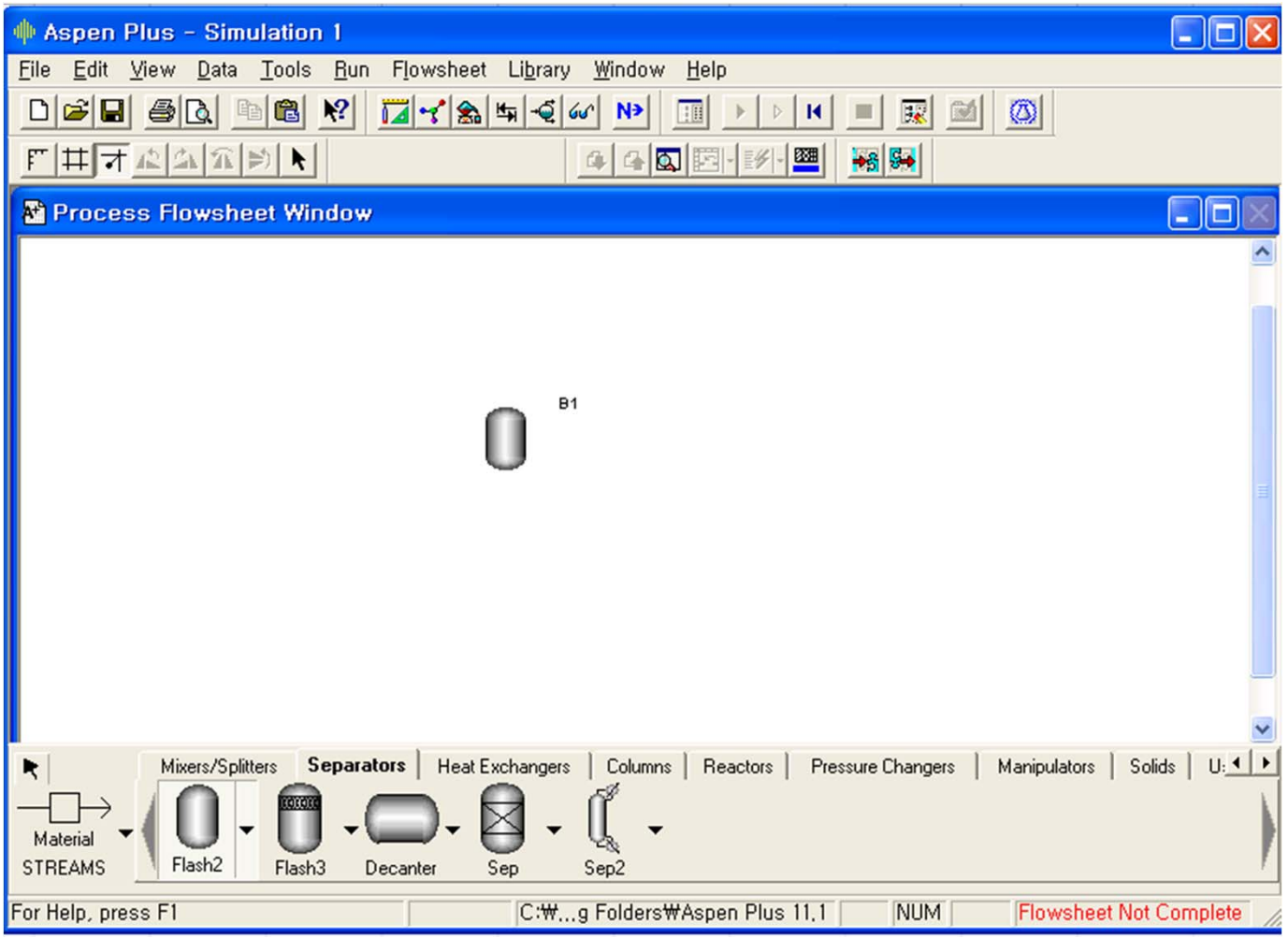
3. Aspen Plus을 이용한 풀이(Flash2)

1단계 – Aspen Plus 실행하기



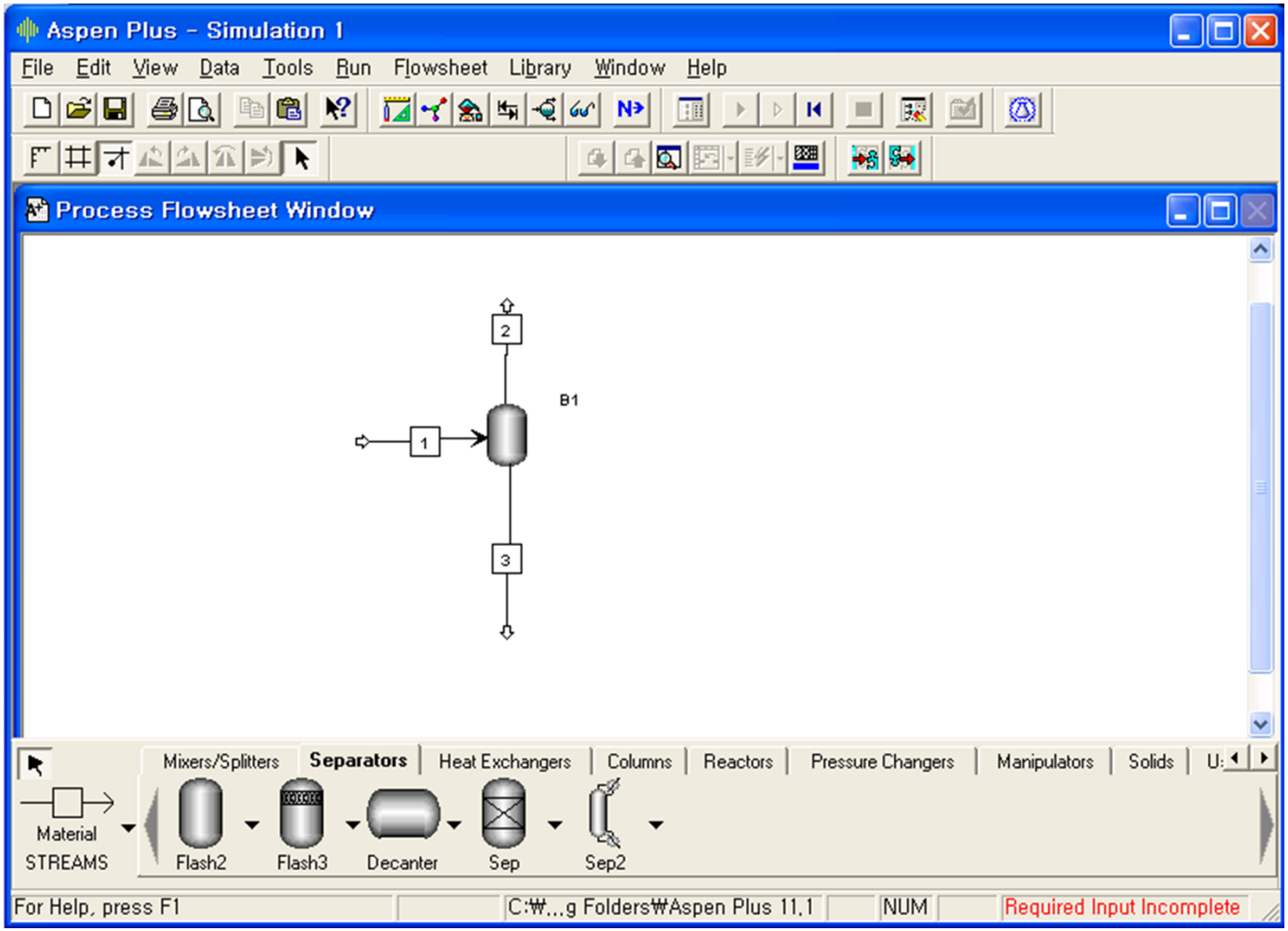
3. Aspen Plus을 이용한 풀이(Flash2)

2단계 – Flash2 선택하기



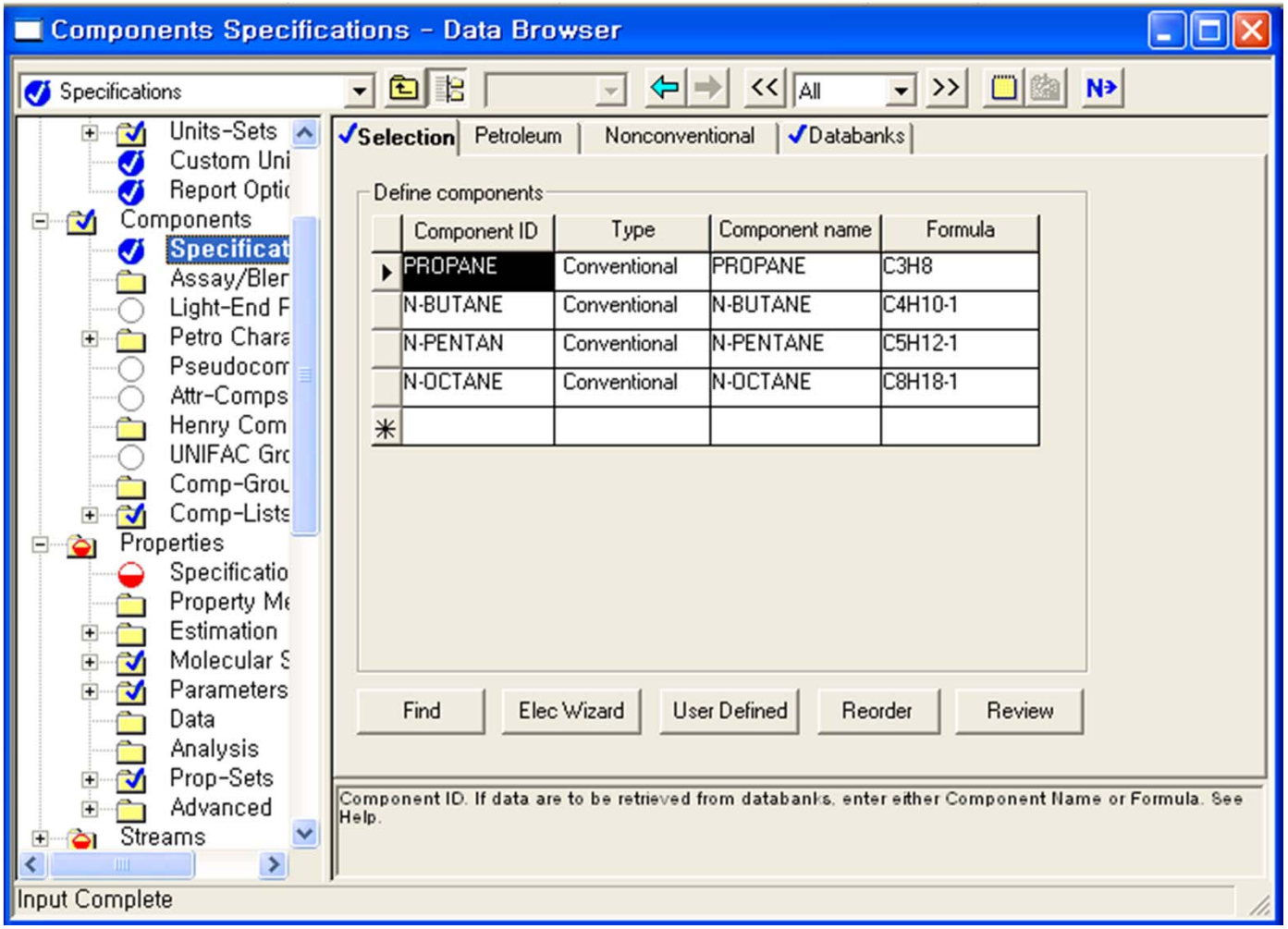
3. Aspen Plus을 이용한 풀이(Flash2)

3, 4단계 – Stream 그리기



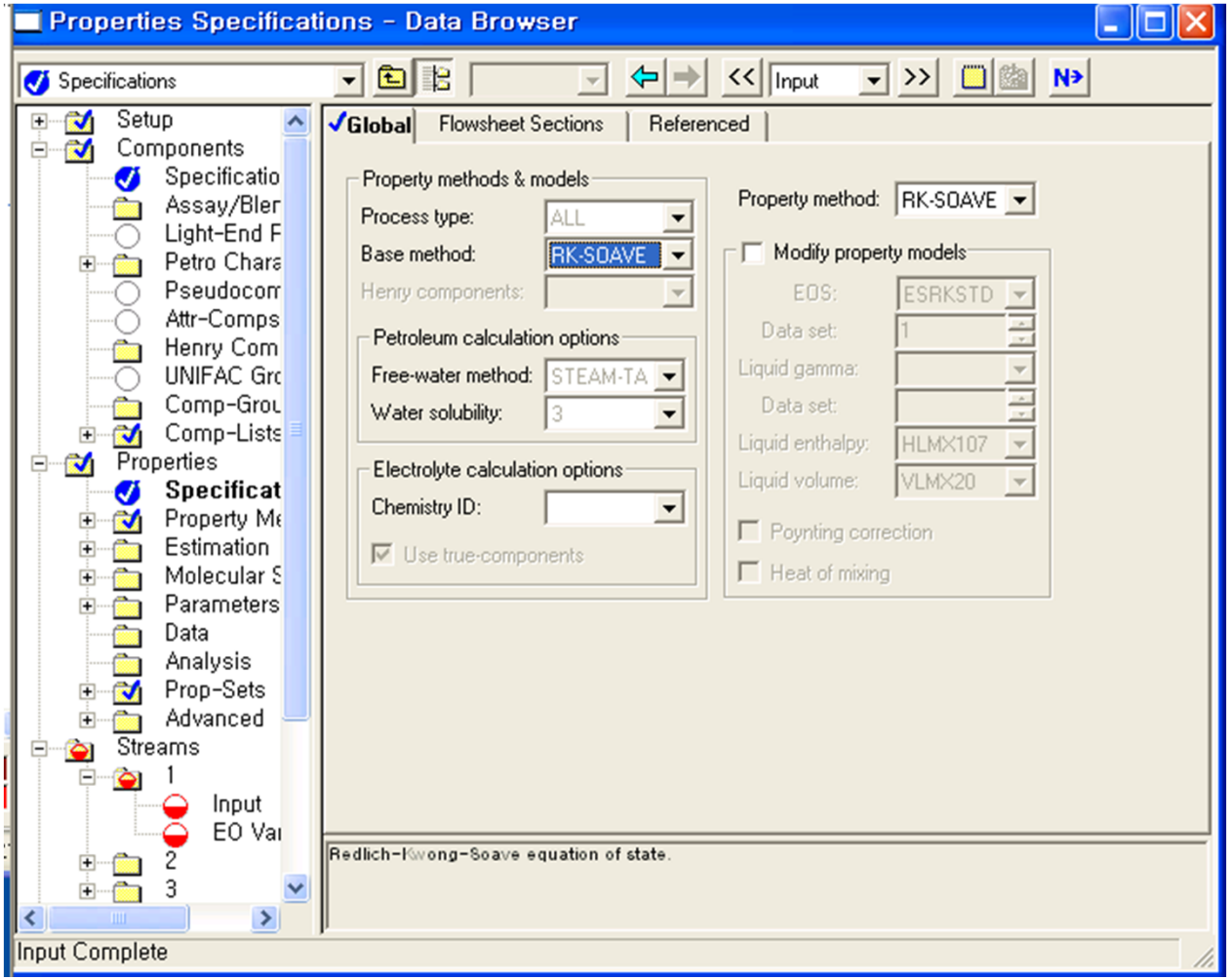
3. Aspen Plus을 이용한 풀이(Flash2)

5단계 – Component/Specification값 입력하기



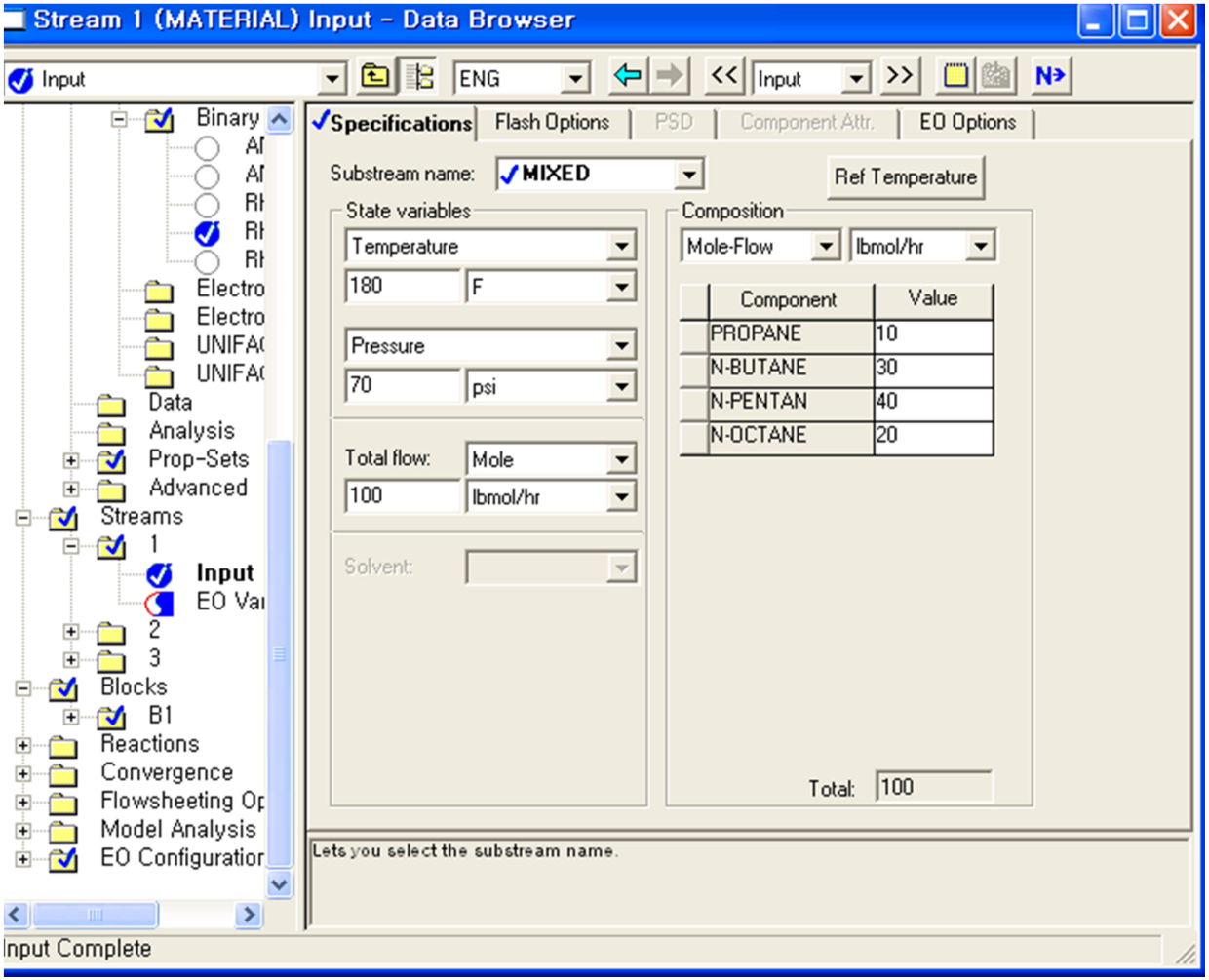
3. Aspen Plus을 이용한 풀이(Flash2)

6단계 – Property/Specification값 입력하기



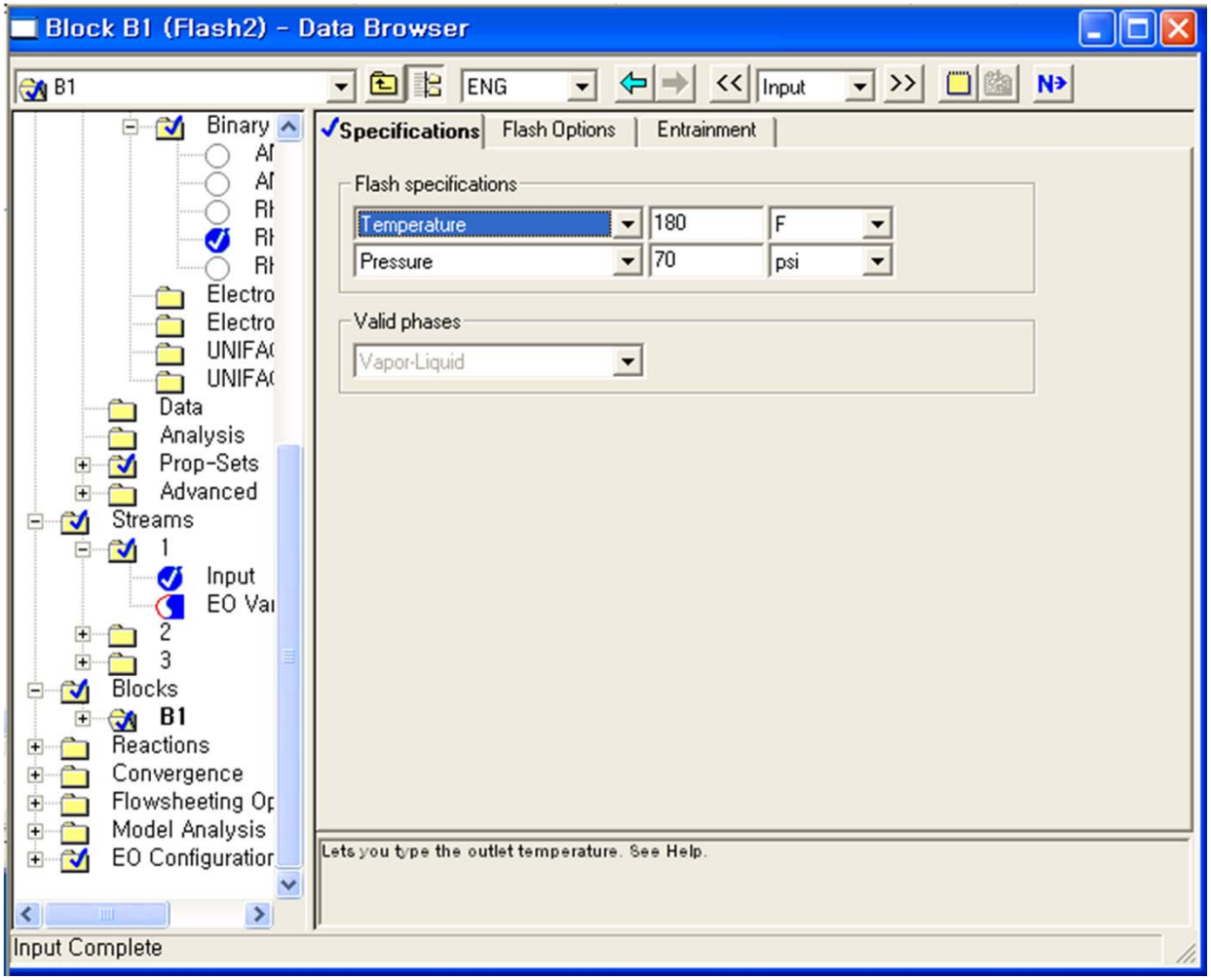
3. Aspen Plus을 이용한 풀이(Flash2)

7단계 – Stream값 입력하기



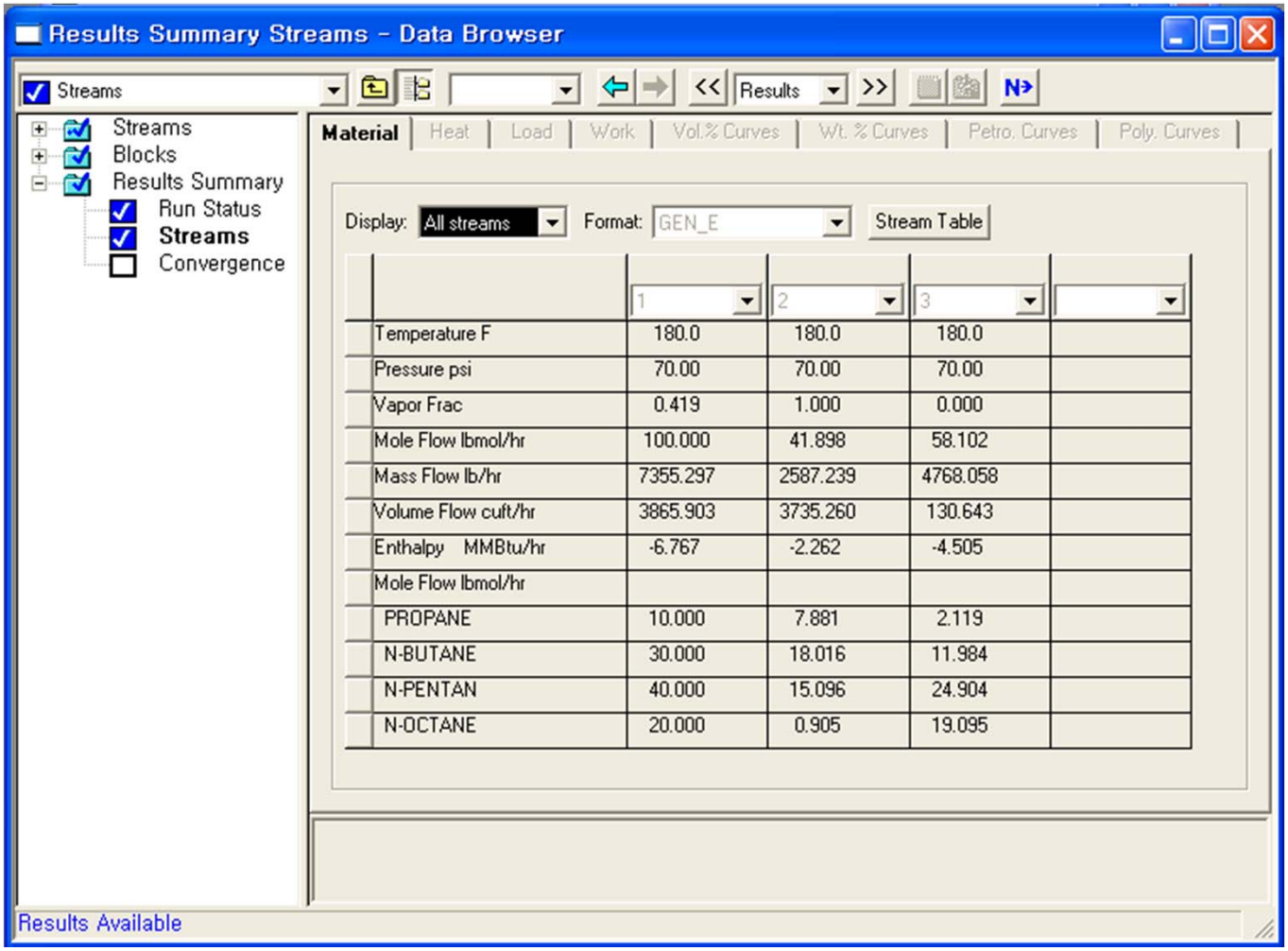
3. Aspen Plus을 이용한 풀이(Flash2)

8단계 – Block값 입력하기



3. Aspen Plus을 이용한 풀이(Flash2)

9단계 – 결과보기



	1	2	3	
Temperature F	180.0	180.0	180.0	
Pressure psi	70.00	70.00	70.00	
Vapor Frac	0.419	1.000	0.000	
Mole Flow lbmol/hr	100.000	41.898	58.102	
Mass Flow lb/hr	7355.297	2587.239	4768.058	
Volume Flow cuft/hr	3865.903	3735.260	130.643	
Enthalpy MMBtu/hr	-6.767	-2.262	-4.505	
Mole Flow lbmol/hr				
PROPANE	10.000	7.881	2.119	
N-BUTANE	30.000	18.016	11.984	
N-PENTAN	40.000	15.096	24.904	
N-OCTANE	20.000	0.905	19.095	

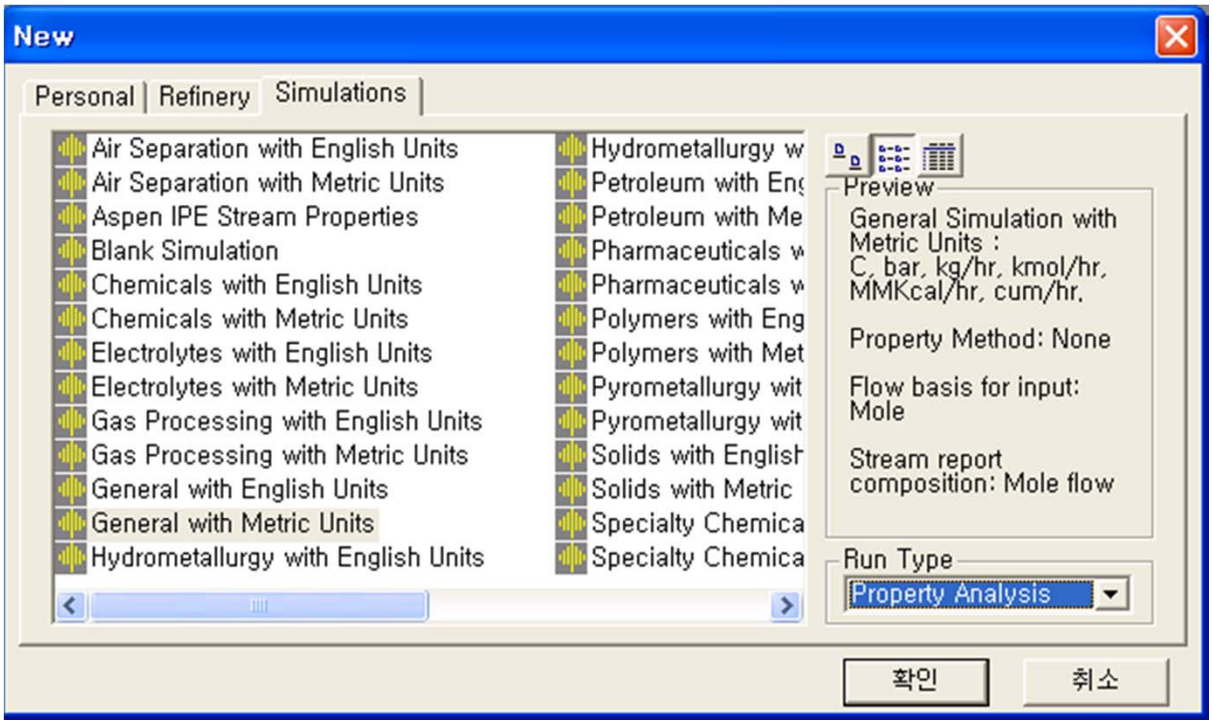
3. Aspen Plus을 이용한 풀이(Flash2)

10단계 – 스프레드시트 형태 변환하기

1		1	2	3
2				
3	Temperature F	180	180	180
4	Pressure psi	70	70	70
5	Vapor Frac	0.419	1	0
6	Mole Flow lbmol/hr	100	41.898	58.102
7	Mass Flow lb/hr	7355.297	2587.239	4768.058
8	Volume Flow cuft/hr	3865.903	3735.26	130.643
9	Enthalpy MMBtu/hr	-6.767	-2.262	-4.505
10	Mole Flow lbmol/hr			
11	PROPANE	10	7.881	2.119
12	N-BUTANE	30	18.016	11.984
13	N-PENTAN	40	15.096	24.904
14	N-OCTANE	20	0.905	19.095

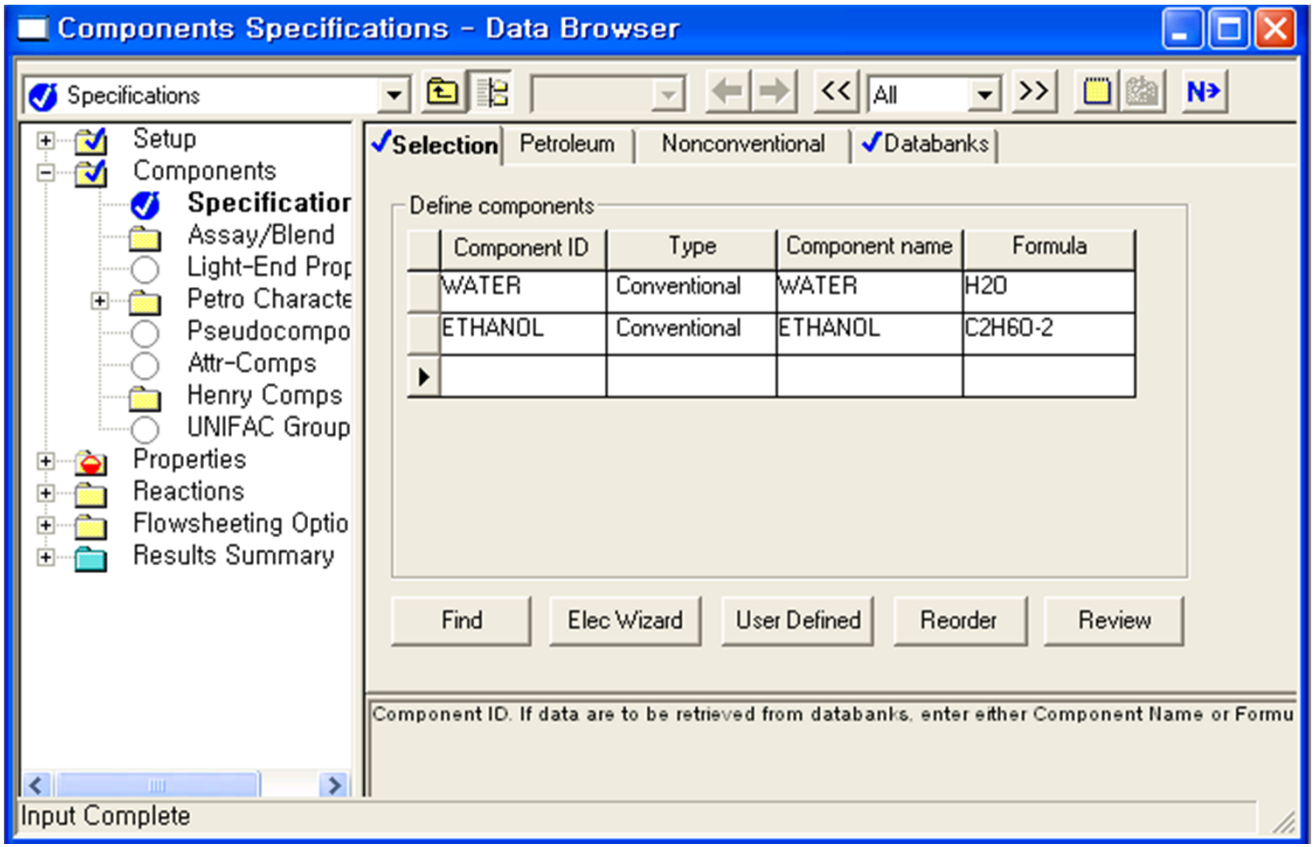
3. Aspen Plus을 이용한 풀이(비이상액체)

1단계 – Aspen Plus 실행하기



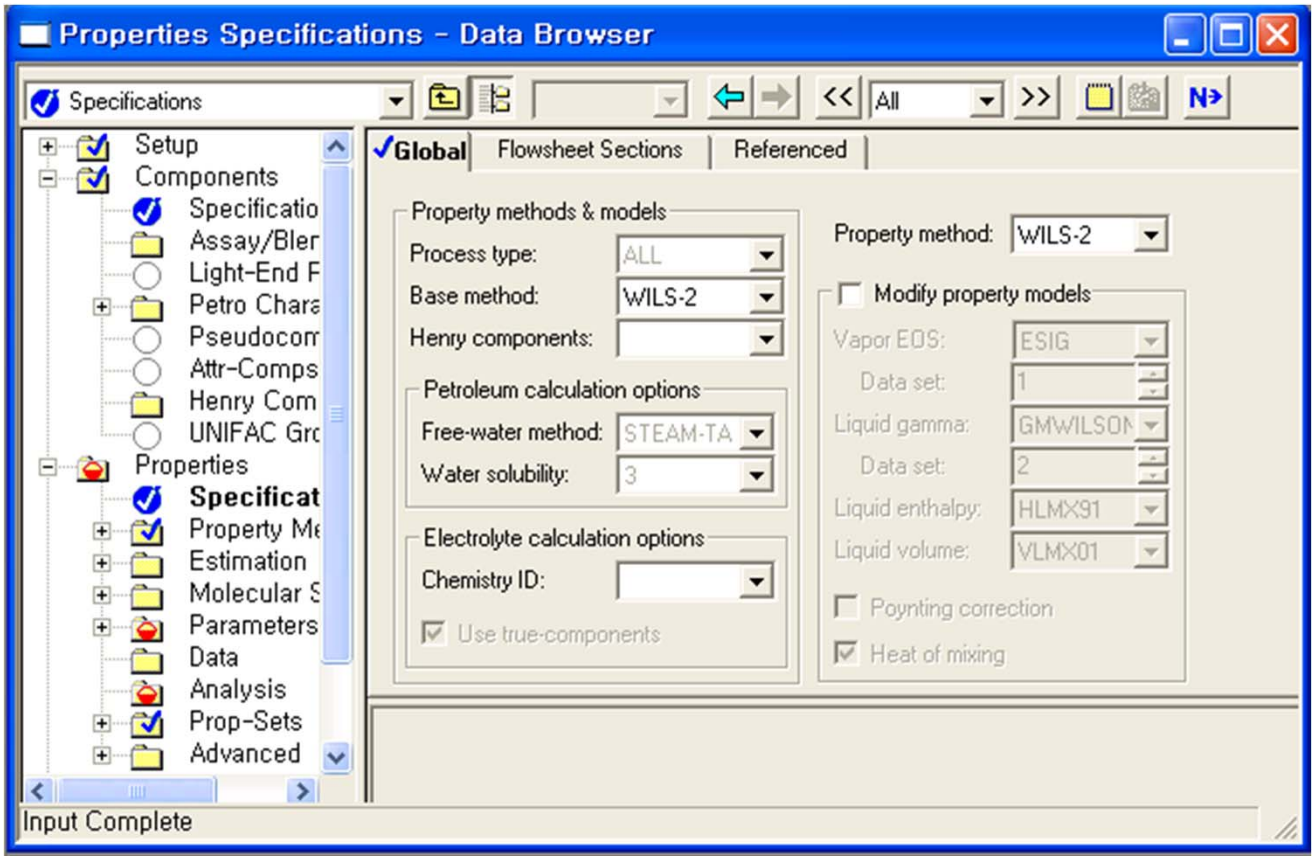
3. Aspen Plus을 이용한 풀이(비이상액체)

2단계 – Component/Specification값 입력하기



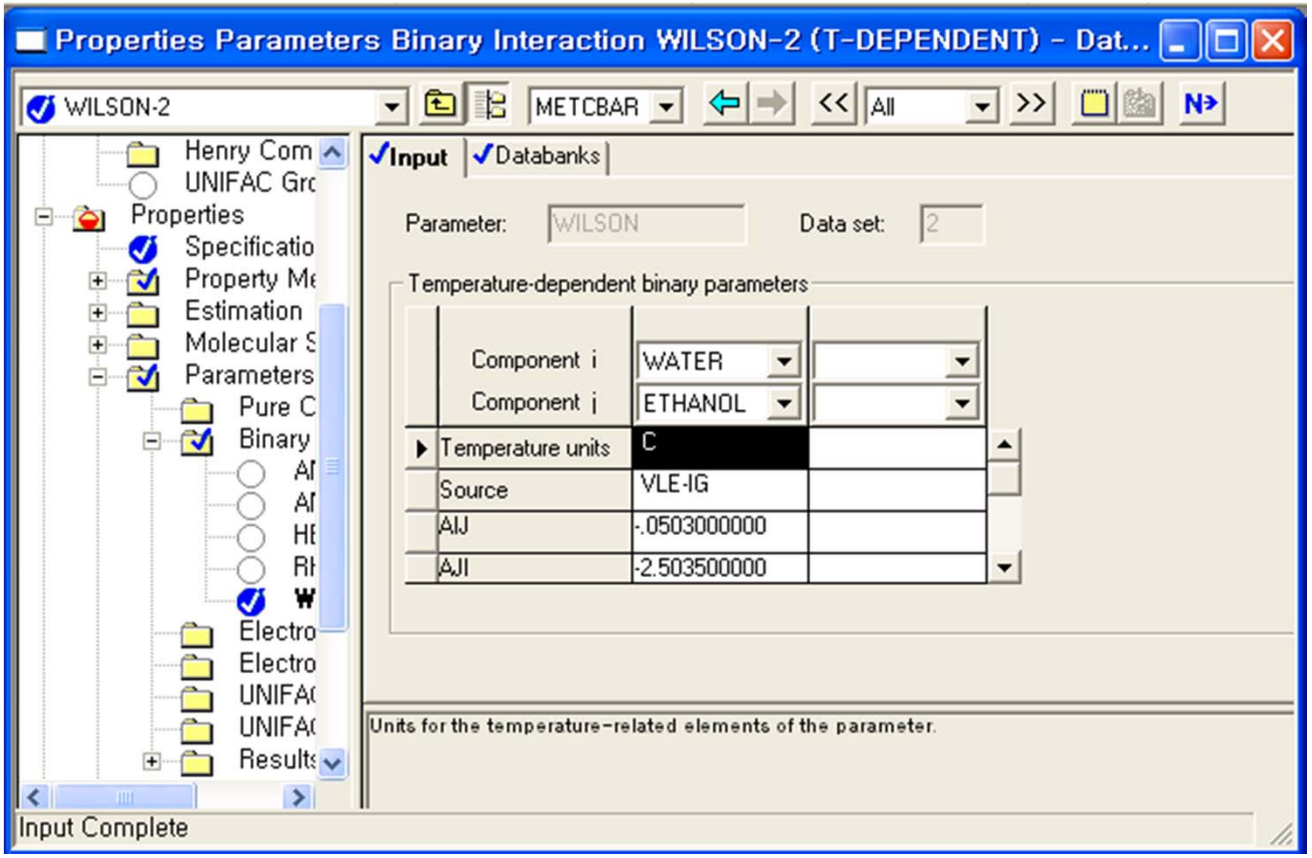
3. Aspen Plus을 이용한 풀이(비이상액체)

3단계 – Property/Specification값 입력하기



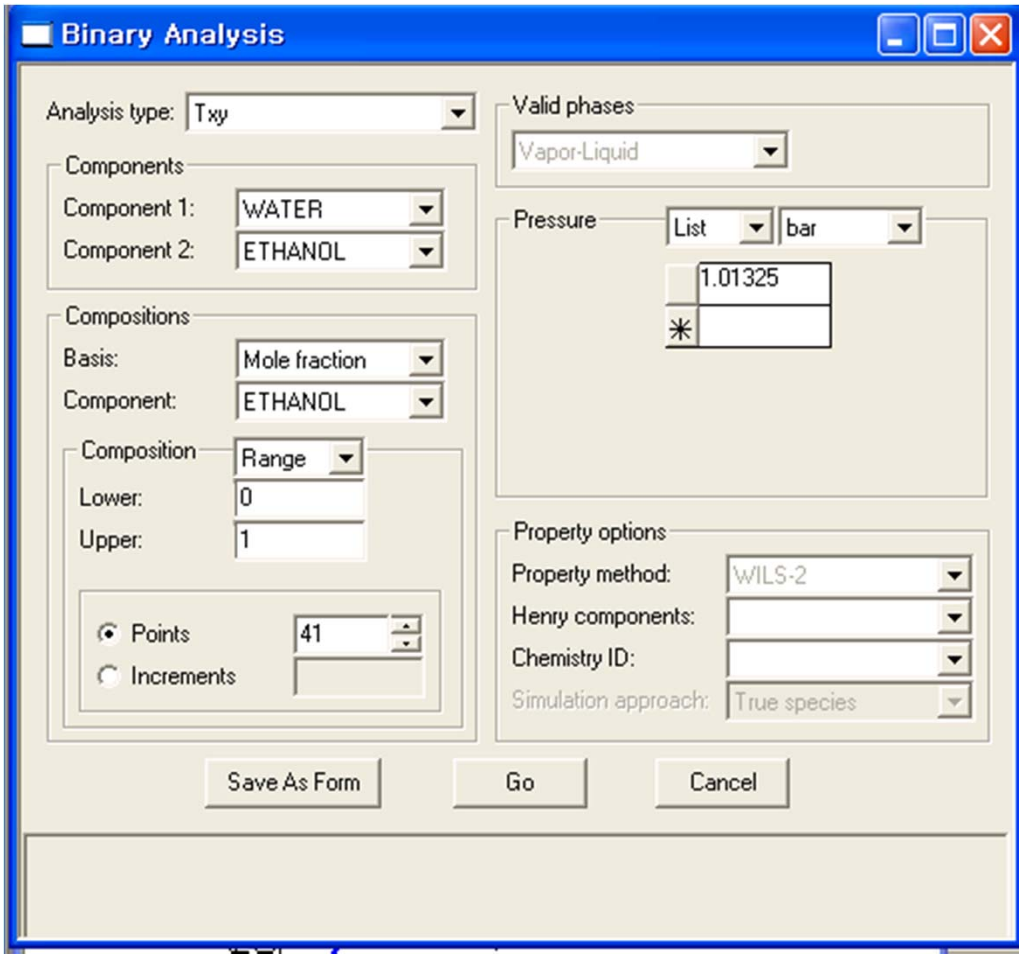
3. Aspen Plus을 이용한 풀이(비이상액체)

4단계 – Property/Parameter값 입력하기



3. Aspen Plus을 이용한 풀이(비이상액체)

5단계 – Tools/Analysis/Property/Binary값 입력하기



3. Aspen Plus을 이용한 풀이(비이상액체)

6단계 – 결과보기