

KINETX Program

Example Screens

Version 1.0

January 2003

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Combustion (KINETX) Program – Example Screens

KINETX - Chemical Reactor Modeling of Combustion

File Help Plot Units

DATA ENTRY | PERFORMANCE | MOL NUMBERS | MOL FRACTIONS | MASS FRACTIONS | EMISSION INDEX

FLOW ELEMENTS (FEs)

For each flow element, enter area A, length L, type (MIX, WSR, or PFR), air flow rate WA and fuel flow rate WF.

	A, in ²	L, in.	Type	WA, lbm/s	WF, lbm/s
1	100.0	50.00	WSR	10.00	0.5000
2	100.0	50.00	PFR	0.000	0.000

RECYCLE ELEMENT (RE)

FUEL
Jet-A (C12H23), heating value 18500. BTU/lbm

AIR or VITIATED AIR
Nominal combustor pressure, psia 14.696
Temperature, °R 540.00
Composition: enter relative mole numbers

O2	N2	H2O	CO2
7.2844E-03	2.7390E-02	0.000	0.000

add FE | del FE | add RE | del RE
CHANGE STATUS OF FLOW ELEMENTS
Add or delete flow elements (FE's)
Add or delete one recycle element (RE)

CURRENT DATA FILE: Bragg.ktx

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UNITS: lbmols i / lbm mixture

FE #:	1	2	EQL	1@Rfmax	1@Blowout
FE type:	WSR	PFR	EQL	(wSR)	(wSR)
C12H23	1.434E-06	1.878E-20	1.000E-20	3.414E-05	4.201E-05
C2H2	1.887E-04	2.052E-05	1.000E-20	2.074E-04	1.950E-04
C2H3	5.612E-06	3.580E-10	1.000E-20	2.067E-05	1.974E-05
C2H4	6.332E-06	9.625E-11	1.000E-20	5.556E-05	6.043E-05
CH2O	1.276E-06	3.783E-08	4.900E-16	2.010E-05	2.380E-05
CH3	4.782E-07	3.810E-08	1.000E-20	3.604E-06	3.989E-06
CH4	2.115E-14	2.478E-14	1.000E-20	1.191E-14	1.109E-14
CO	1.044E-04	7.454E-05	1.068E-05	2.357E-04	2.674E-04
CO2	2.890E-03	3.300E-03	3.405E-03	2.166E-03	2.052E-03
HCO	1.145E-06	2.486E-08	1.086E-12	1.301E-05	1.414E-05
H	1.760E-05	6.072E-06	2.865E-07	1.123E-05	1.026E-05

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Flow element #:	1	2	EQL	1@Rfmax	1@Blowout
Flow element type:	WSR	PFR	EQL	(wSR)	(wSR)
Equivalence ratio	0.7282	0.7282	0.7282	0.7282	0.7282
Residence time, s	3.5397E-03	3.2738E-03	0.000	6.2447E-04	6.3181E-04
Air loading, l / l-BO	0.1419	0.000	0.000	0.9797	1.000
Area, in ²	100.0	100.0	0.000	100.0	100.0
Length, in.	50.00	50.00	0.000	7.241	7.094
Volume, in ³	5000.	5000.	0.000	724.1	709.4
Space velocity, ft/s	1177.	1307.	0.000	966.3	935.7
Flow rate, lbm/s	10.50	10.50	10.50	10.50	10.50
Enthalpy, BTU/lbm	-36.34	-36.34	-36.34	-36.34	-36.34
Combustion efficiency	0.8569	0.9758	1.000	0.6742	0.6479
Temperature, °R	3057.	3406.	3476.	2521.	2443.

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FE type:	WSR	PFR	EQL	(wSR)	(wSR)
C12H23	1.434E-06	1.878E-20	1.000E-20	3.414E-05	4.201E-05
C2H2	1.887E-04	2.052E-05	1.000E-20	2.074E-04	1.950E-04
C2H3	5.612E-06	3.580E-10	1.000E-20	2.067E-05	1.974E-05
C2H4	6.332E-06	9.625E-11	1.000E-20	5.556E-05	6.043E-05
CH2O	1.276E-06	3.783E-08	4.900E-16	2.010E-05	2.380E-05
CH3	4.782E-07	3.810E-08	1.000E-20	3.604E-06	3.989E-06
CH4	2.115E-14	2.478E-14	1.000E-20	1.191E-14	1.109E-14
CO	1.044E-04	7.454E-05	1.068E-05	2.357E-04	2.674E-04
CO2	2.890E-03	3.300E-03	3.405E-03	2.166E-03	2.052E-03
HCO	1.145E-06	2.486E-08	1.086E-12	1.301E-05	1.414E-05
H	1.760E-05	6.072E-06	2.865E-07	1.123E-05	1.026E-05

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UNITS: lbm i / lbm mixture

FE #:	1	2	EQL	1@Rfmax	1@Blowout
FE type:	WSR	PFR	EQL	(WSR)	(WSR)
C12H23	2.399E-04	3.142E-18	1.673E-18	5.713E-03	7.029E-03
C2H2	4.913E-03	5.344E-04	2.604E-19	5.401E-03	5.077E-03
C2H3	1.518E-04	9.683E-09	2.705E-19	5.591E-04	5.340E-04
C2H4	1.776E-04	2.700E-09	2.805E-19	1.559E-03	1.695E-03
CH2O	3.831E-05	1.136E-06	1.471E-14	6.035E-04	7.147E-04
CH3	7.190E-06	5.729E-07	1.504E-19	5.418E-05	5.998E-05
CH4	3.392E-13	3.975E-13	1.604E-19	1.911E-13	1.779E-13
CO	2.925E-03	2.088E-03	2.993E-04	6.601E-03	7.491E-03
CO2	0.127	0.145	0.150	9.532E-02	9.029E-02
HCO	3.324E-05	7.214E-07	3.151E-11	3.775E-04	4.102E-04
H	1.774E-05	6.121E-06	2.888E-07	1.132E-05	1.034E-05

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File Help Plot Units

DATA ENTRY | PERFORMANCE | MOL NUMBERS | MOL FRACTIONS | MASS FRACTIONS | EMISSION INDEX

UNITS: lbm i / 1000 lbm mixture

FE #:	1	2	EQL	1@Rfmax	1@Blowout
FE type:	WSR	PFR	EQL	(WSR)	(WSR)
C12H23	5.04	6.599E-14	3.514E-14	120.	148.
C2H2	103.	11.2	5.468E-15	113.	107.
C2H3	3.19	2.033E-04	5.680E-15	11.7	11.2
C2H4	3.73	5.670E-05	5.891E-15	32.7	35.6
CH2O	0.805	2.385E-02	3.090E-10	12.7	15.0
CH3	0.151	1.203E-02	3.157E-15	1.14	1.26
CH4	7.124E-09	8.347E-09	3.369E-15	4.013E-09	3.735E-09
CO	61.4	43.8	6.28	139.	157.
CO2	2.671E+03	3.050E+03	3.147E+03	2.002E+03	1.896E+03
HCO	0.698	1.515E-02	6.616E-07	7.93	8.61
H	0.373	0.129	6.064E-03	0.238	0.217

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