

Example Problem							Tin= 25 C			
1.00E+06 lb raw coal/hr							Tout= 1000 C			
	daf wt%	as rec'd	mass (lb/hr)	lb moles/hr	O2/element	lb moles O2/hr				
C	80.72%	73.36%	7.336E+05	6.113E+04	1	6.113E+04				
H	5.76%	5.23%	5.235E+04	2.617E+04	0.25	6.543E+03				
O	11.58%	10.52%	1.052E+05	6.577E+03	-0.5	-3.289E+03				
N	1.57%	1.43%	1.427E+04	1.019E+03	0	0.000E+00				
S	0.37%	0.34%	3.363E+03	1.051E+02	1	1.051E+02				
	100.00%									
ash	4.49%	4.49%	4.490E+04							
moisture	4.63%	4.63%	4.630E+04	2.572E+03						
	9.12%	100.00%								
						Total O2=	6.449E+04 lb moles O2/hr			
							2.064E+06 lb O2/hr			
						6% Excess=	6.836E+04 lb moles O2/hr			
							2.188E+06 lb O2/hr			
						Total N2=	2.577E+05 lb moles N2/hr			
							7.215E+06 lb N2/hr			
						Total CO2=	6.113E+04 lb moles CO2/hr			
						Total H2O=	1.566E+04 lb moles H2O/hr			
						Total SO2=	1.051E+02 lb moles SO2/hr			
Cp Data										
	a	b	c	d	T	Form	DelH_f	ndot (gmol/hr)	int(Cp dT)	Del H (kJ/hr)
CO2	3.61E-02	4.23E-05	-2.89E-08	7.46E-12	C	1	-393.5	2.775E+07	4.86E+01	1.349E+09
H2O(g)	3.35E-02	6.88E-06	7.60E-09	-3.59E-12	C	1	-241.83	7.109E+06	3.77E+01	2.680E+08
O2	2.91E-02	1.16E-05	-6.08E-09	1.31E-12	C	1	0	1.757E+06	3.25E+01	5.703E+07
N2	2.90E-02	2.20E-06	5.72E-09	-2.87E-12	C	1	0	1.170E+08	3.06E+01	3.576E+09
SO2	3.89E-02	3.90E-05	-3.10E-08	8.61E-12	C	1	-296.6	4.771E+04	4.92E+01	2.349E+06
ash	8.00E-01 kJ/kg-C							mdot (kg/hr)	kJ/kg	
								2.038E+04	780	1.590E+07
Heat of vaporization =	4.07E+01	kJ/mol	3.37E+08	kJ/hr	(moisture plus water from combustion)			Sum=	5.268E+09 kJ/hr	
Heat of combustion=	13280	Btu/lb as rec'd	-1.40E+10	kJ/hr	(negative because exothermic)					
Qdot=	-8.40E+09	kJ/hr								
	-2.33E+06	kW								
	-2.33E+03	MW	Heat transferred to steam! (therefore negative)							
Electricity at 34% efficiency =			793 MW							