

Engineering Software

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Combustion Analysis

Here are some of the basic combustion information and plots when considering gas (methane) as the fuel and air as the oxidant.

Combustion Assumptions

- Fuel Temperature 298 [K]**
- Oxidant Temperature 298 [K]**
- Stoichiometric Combustion**
- No Heat Losses**

Fuel (Gas -- Methane) Composition

Element	Weight [kg/kg]	Mole [kmol/kmol]
CH_4	1.00	1.00

Oxidant (Air) Composition

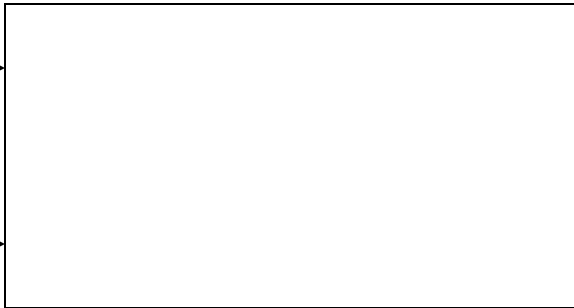
Element	Weight [kg/kg]	Mole [kmol/kmol]
N	0.767	0.790
O	0.233	0.210

Combustion Schematic Layout

Fuel -- Gas (Methane)



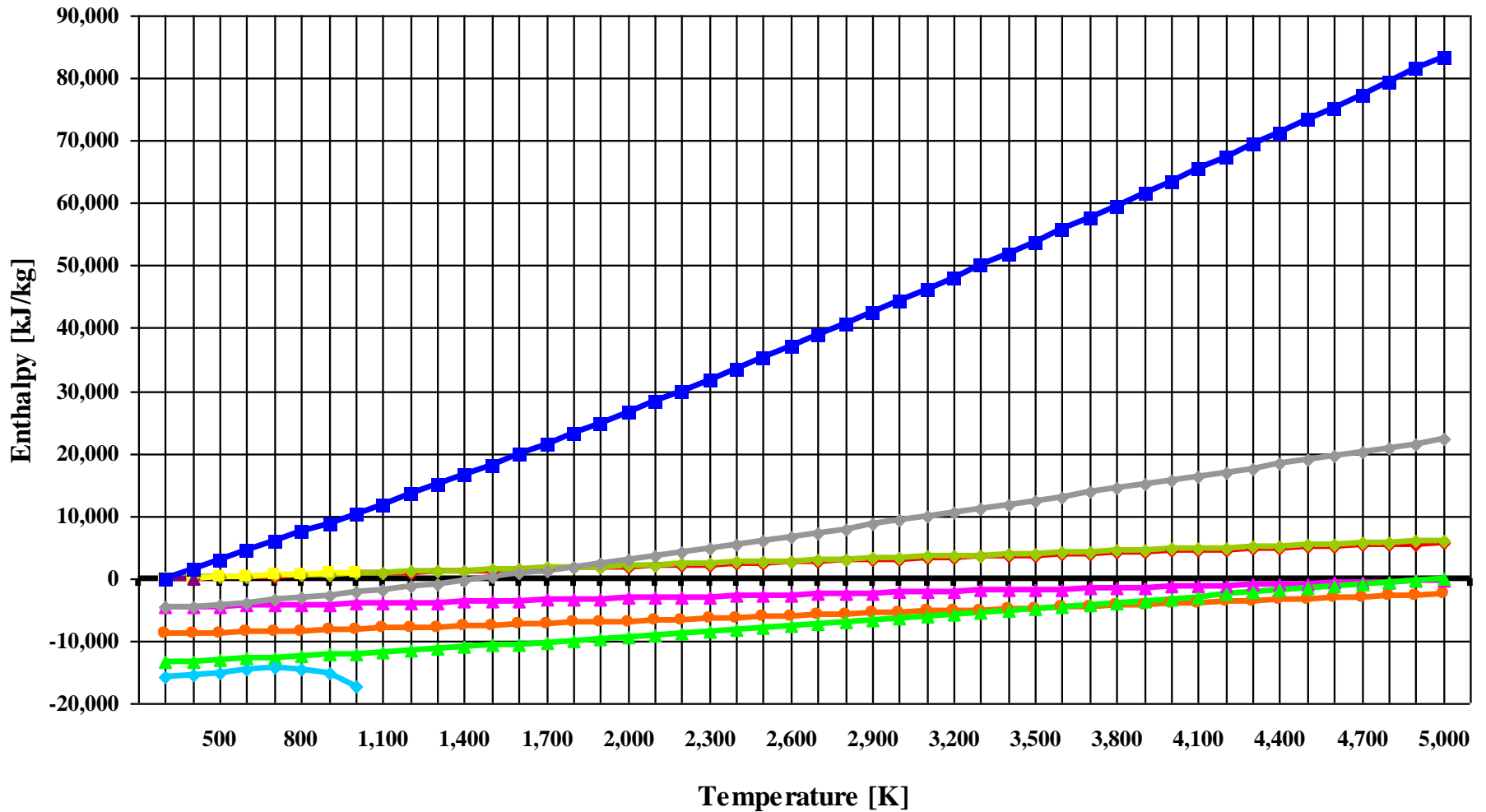
Oxidant -- Air

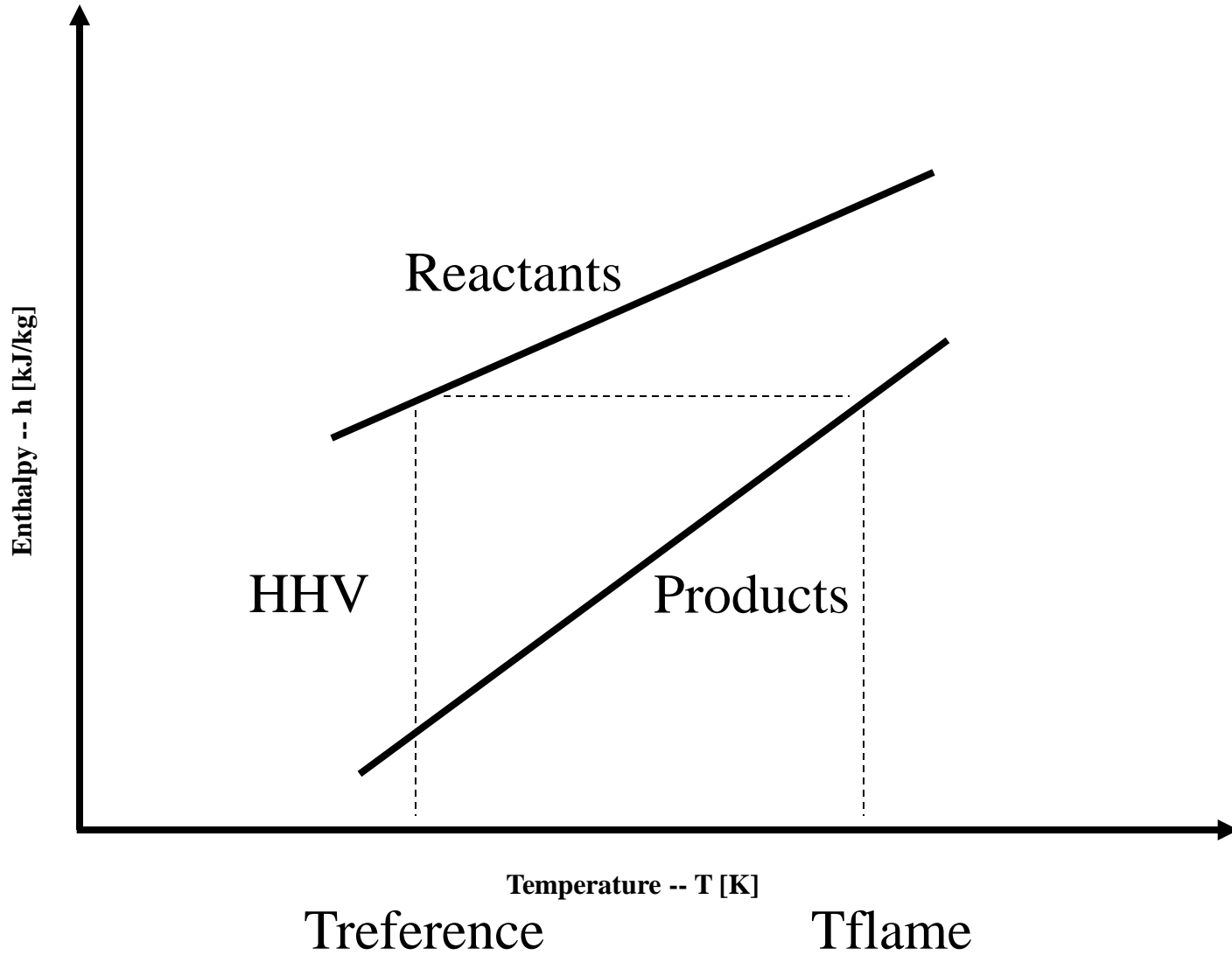


Combustion Products



Enthalpy vs Temperature





Enthalpy - Temperature $h - T$ Diagram

Combustion Products Composition

Element	Weight [kg/kg]	Mole [kmol/kmol]
CO ₂	0.151	0.095
H ₂ O	0.124	0.190
SO ₂	0.000	0.000
N ₂	0.725	0.715
O ₂	0.000	0.000

Combustion Values

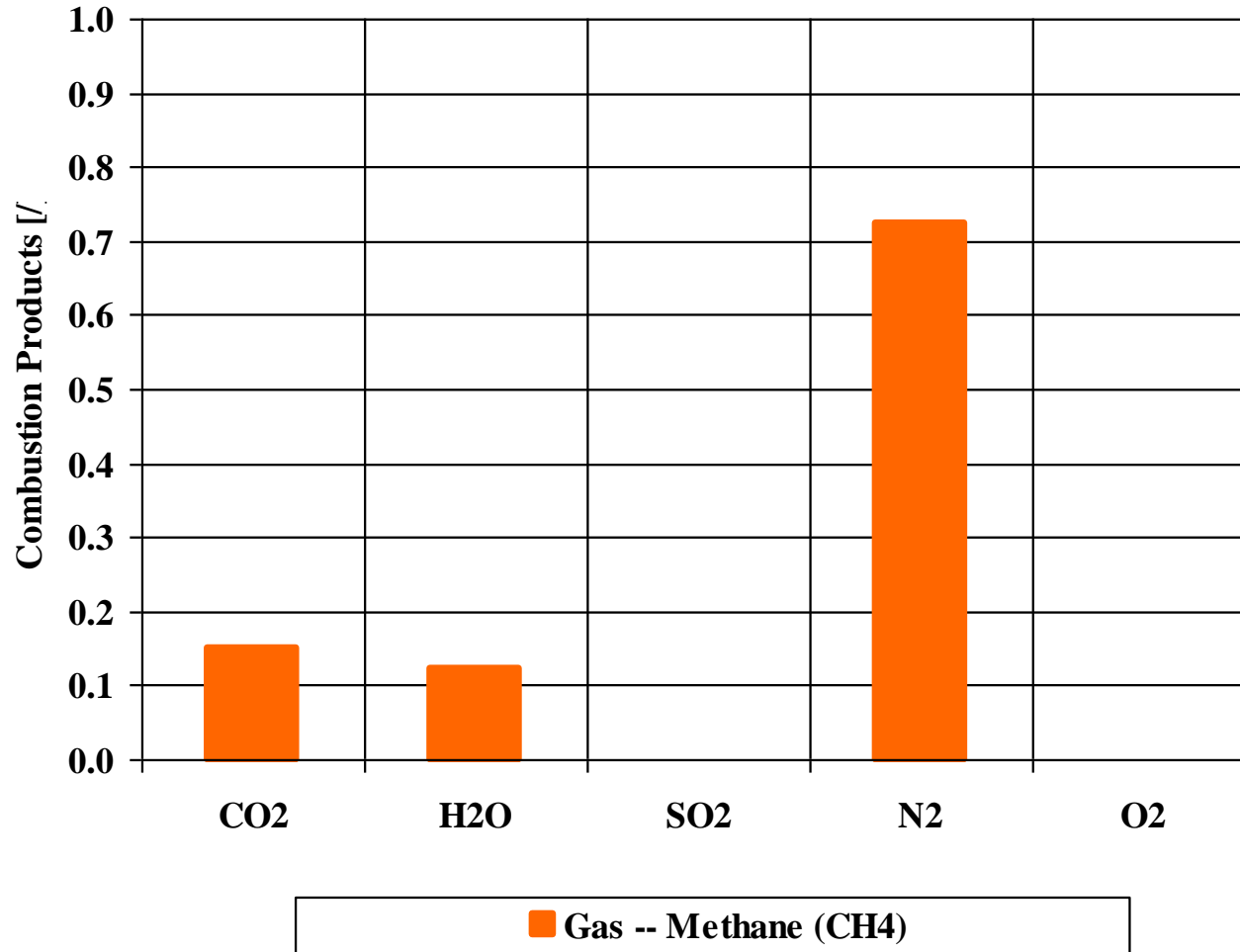
Flame Temperature

2,327 [K]

Oxidant To Fuel Ratio

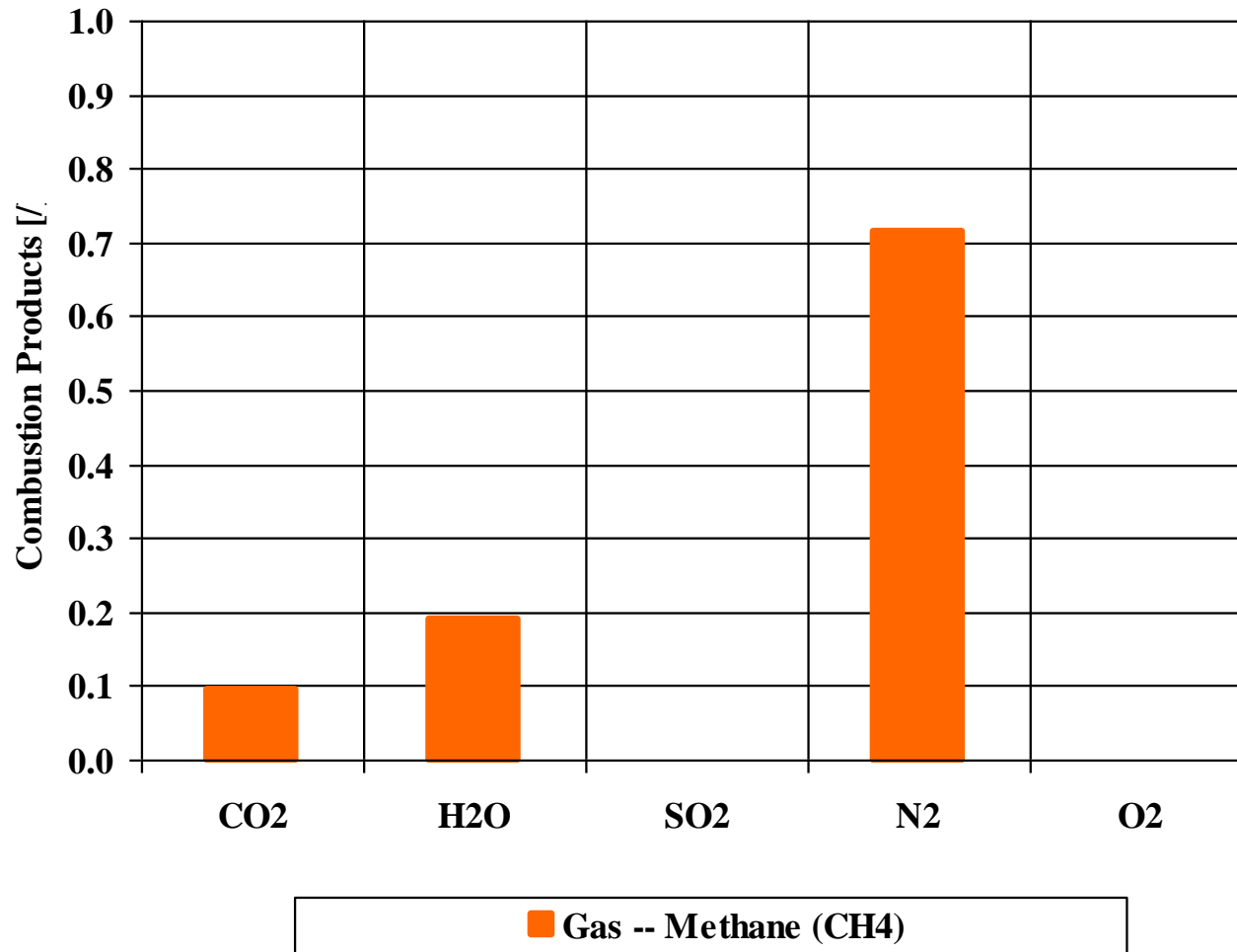
17.167 [/]

Combustion Products -- Weight Basis



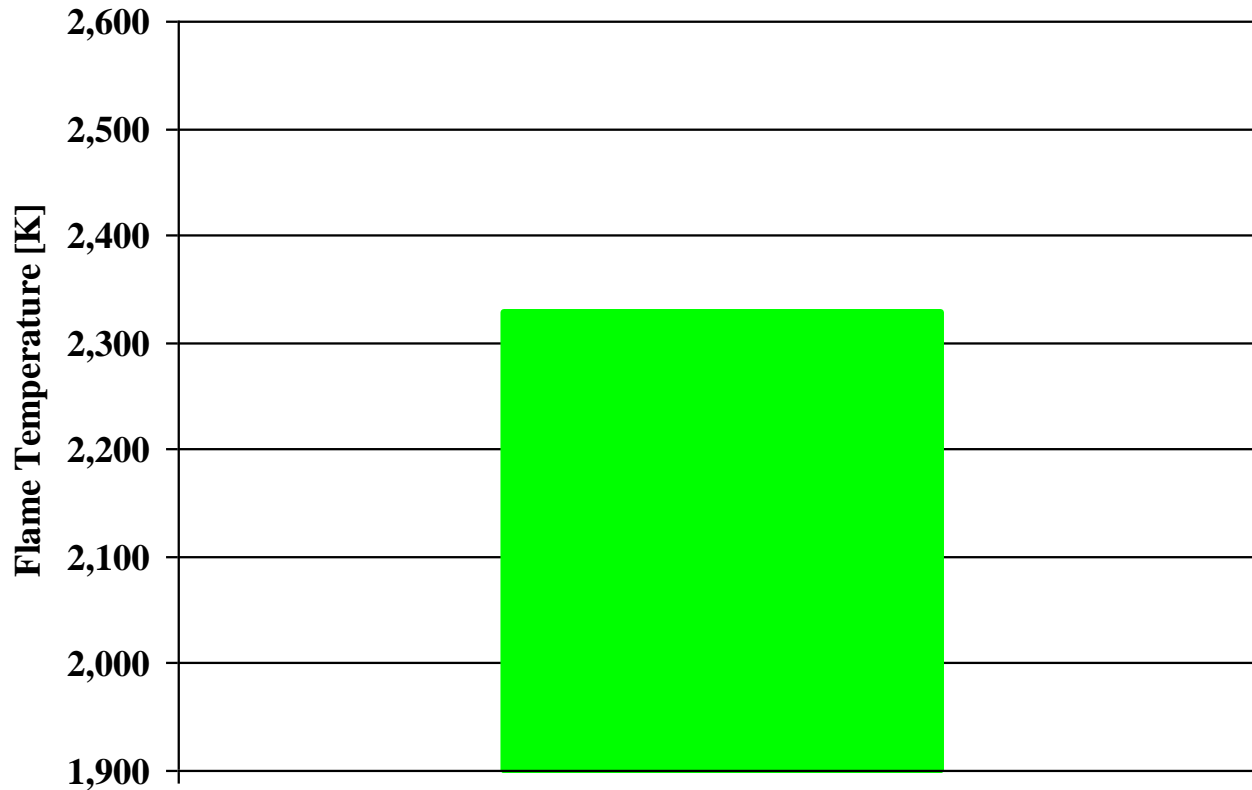
Fuel and Oxidant Inlet Temperature: 298 [K]

Combustion Products -- Mole Basis



Fuel and Oxidant Inlet Temperature: 298 [K]

Combustion Products Flame Temperature

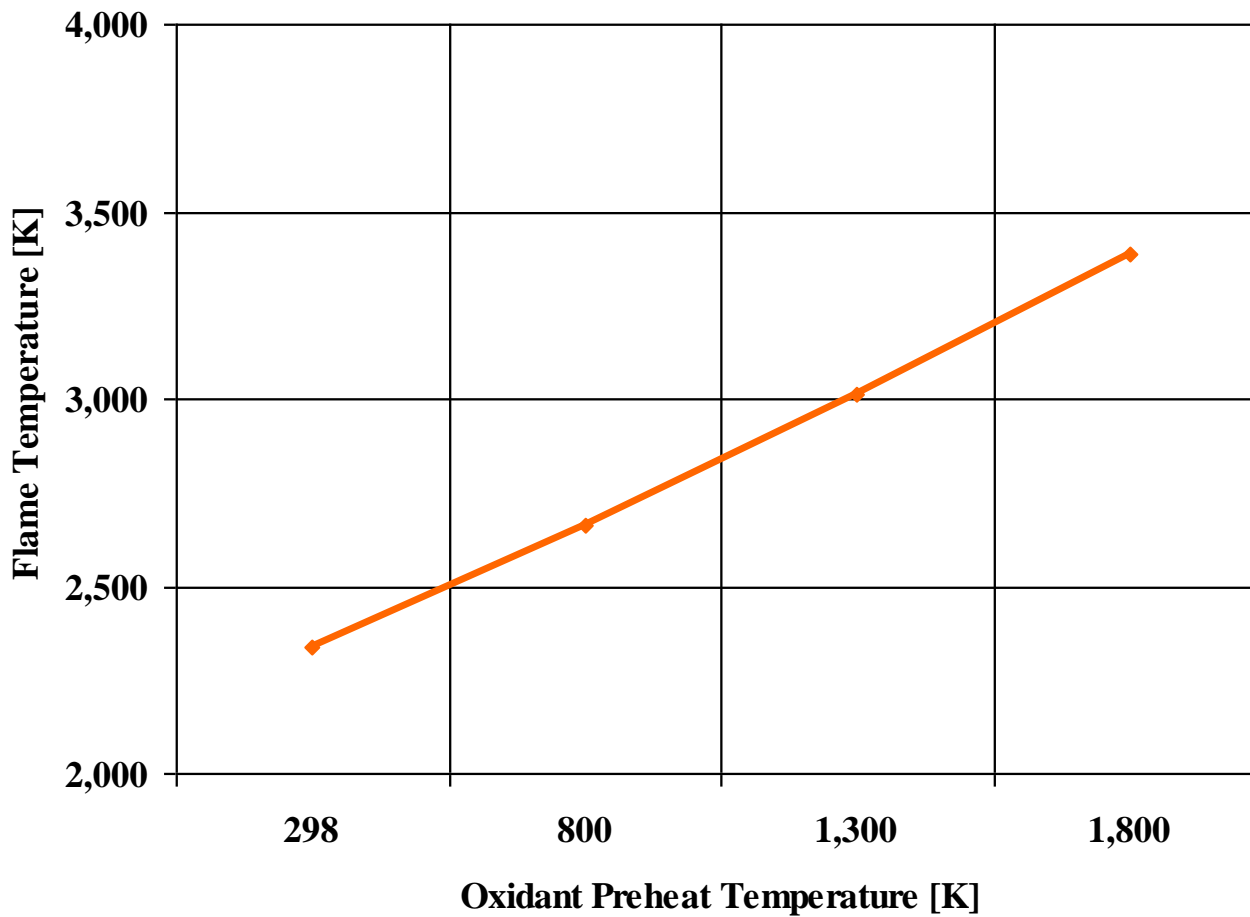


Gas -- Methane (CH4)

■ Flame Temperature

Fuel and Oxidant Inlet Temperature: 298 [K]

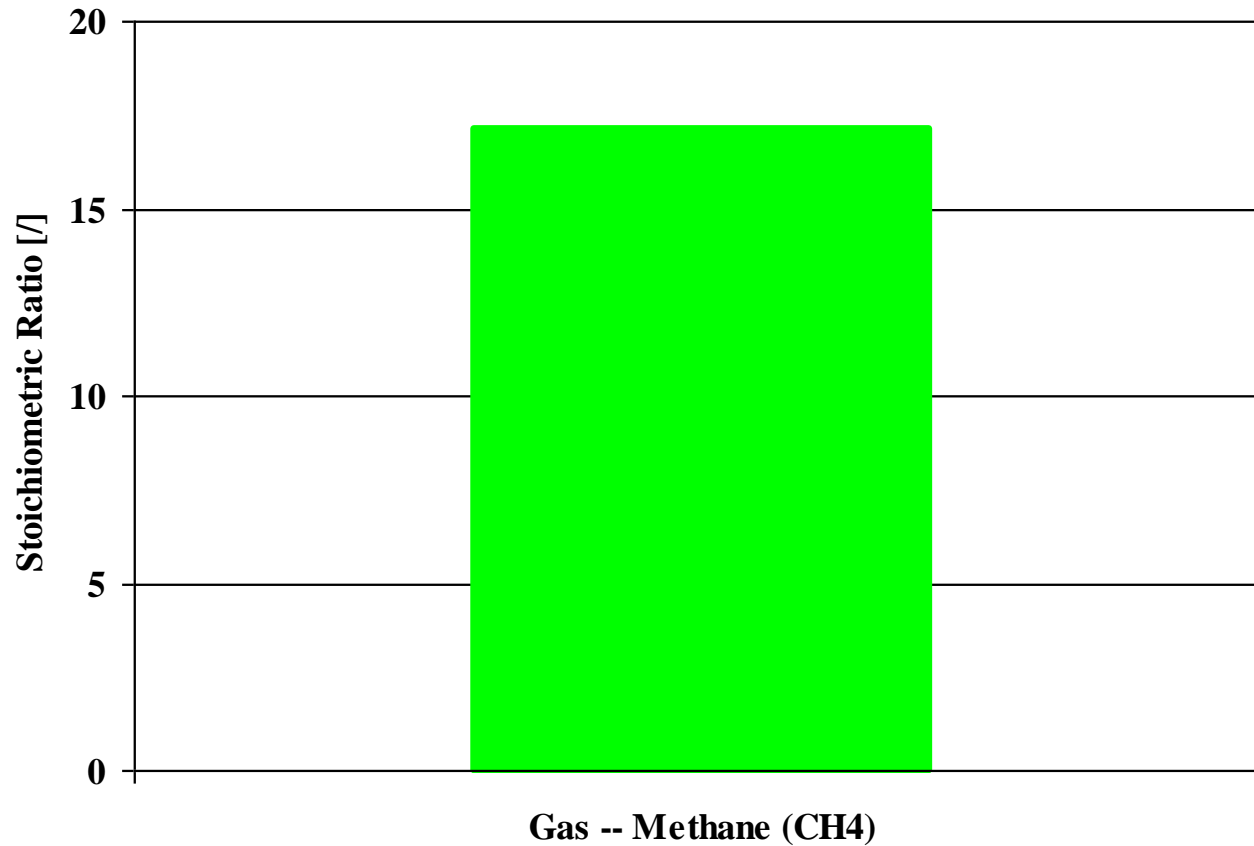
Combustion Products Flame Temperature (Gas as Fuel)



—◆— Flame Temperature

Fuel Inlet Temperature: 298 [K]

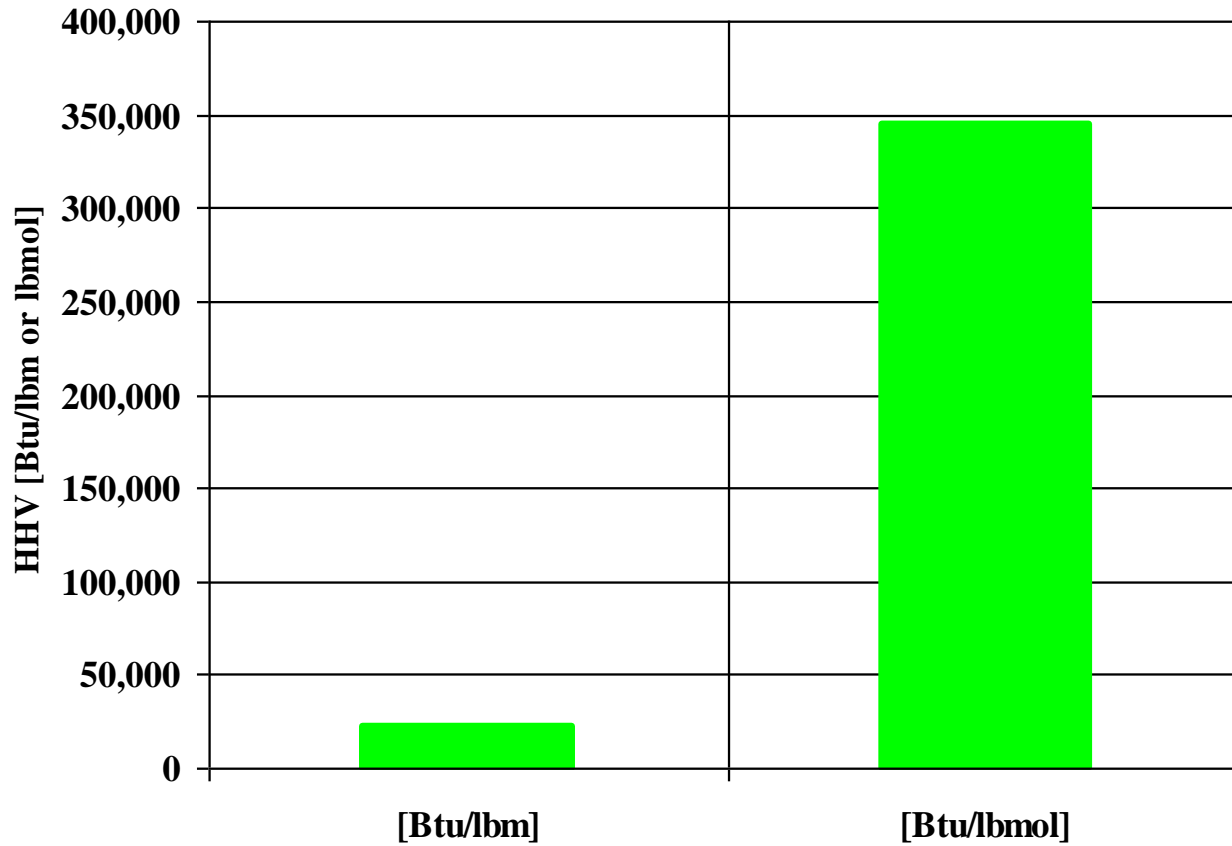
Combustion Stoichiometric Ratio



■ Stoichiometric Ratio (Oxidant to Fuel)

Fuel and Oxidant Inlet Temperature: 298 [K]

Higher Heating Value (HHV)



■ HHV

Fuel and Oxidant Inlet Temperature: 298 [K]

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