Heat of Reaction Activity

(Methane, Propane, Methanol, Nitromethane)

1. ***Write a balanced reaction for your assigned fuel with air under stoichiometric conditions. Verify the mass balance for each atom.***

Methane (CH4) (with products at 2500 K)

Propane (C3H8)

Iso-Octane (C8H18)

Methanol (CH4O)

Nitromethane (CH3NO2)

1. ***Using separate enthalpies for each species calculate the lower heating value on a per mole of fuel and per kilogram of fuel. Assume standard temperature and pressure conditions as well as an equivalence ratio of unity. Compare this with the calorific value given in Table A.3. How does the lower heating value change as the mixture is made leaner? How does the heat of reaction change if the water vapor condenses?***

LHV = h(products) – h(reactants)

H(products) = Σ (chemical coefficient \* species enthalpy) for products

H(reactants) = Σ (chemical coefficient \* species enthalpy) for reactants





