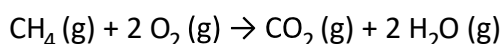


Enthalpy Change of Combustion of Methane

This application calculates the enthalpy change of combustion of methane at standard conditions, given the reaction



The enthalpy of methane, oxygen, carbon dioxide and water are computed using the empirical correlations in the ThermophysicalData:-Chemicals package.

```
> with(ThermophysicalData:-Chemicals):
```

Temperature at standard conditions

```
> T := 298.15*Unit(K):
```

Enthalpy at standard conditions

```
> h_CH4 := Property("Hmolar", "CH4(g)", "temperature" = T):
  h_O2 := Property("Hmolar", "O2(g)", "temperature" = T):
  h_CO2 := Property("Hmolar", "CO2(g)", "temperature" = T):
  h_H2O := Property("Hmolar", "H2O(g)", "temperature" = T):
```

Hence the enthalpy change of combustion is

$$\begin{aligned} > h_{\text{CO}_2} + 2 * h_{\text{H}_2\text{O}} - (h_{\text{CH}_4} + 2 * h_{\text{O}_2}) \\ & \quad -802.56 \frac{\text{kJ}}{\text{mol}} \end{aligned} \quad (1)$$

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