C.02.01.A1 – Modelo de Mistura Reativa Ideal

Aplicação em FTAF – Finite Time Air-Fuel Otto Engine Model

Prof. C. Naaktgeboren, PhD



https://github.com/CNThermSci/ApplThermSci Compiled on 2020-09-11 02h01m08s UTC





$$\bar{c}_p(T) = a_1 + a_2 T + a_3 T^2 + a_4 T^3,$$

$$T_{min} \leqslant T \leqslant T_{max}$$
 —





$$\bar{c}_p(T) = a_1 + a_2 T + a_3 T^2 + a_4 T^3,$$

 $\bar{c}_v(T) = b_1 + b_2 T + b_3 T^2 + b_4 T^3.$

$$T_{min} \leqslant T \leqslant T_{max}$$
 \neg





$$\bar{c}_p(T) = a_1 + a_2 T + a_3 T^2 + a_4 T^3, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{c}_v(T) = b_1 + b_2 T + b_3 T^2 + b_4 T^3, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{u}(T) = \left(b_1 T + \frac{b_2 T^2}{2} + \frac{b_3 T^3}{3} + \frac{b_4 T^4}{4}\right)_T^T, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg$$





$$\bar{c}_p(T) = a_1 + a_2 T + a_3 T^2 + a_4 T^3, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg$$

$$\bar{c}_v(T) = b_1 + b_2 T + b_3 T^2 + b_4 T^3, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg$$

$$\bar{u}(T) = \left(b_1 T + \frac{b_2 T^2}{2} + \frac{b_3 T^3}{3} + \frac{b_4 T^4}{4}\right)_{T_{ref}}^T, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg$$

$$\bar{h}(T) = \left(a_1 T + \frac{a_2 T^2}{2} + \frac{a_3 T^3}{3} + \frac{a_4 T^4}{4}\right)_{T_{ref}}^T + \bar{R} T_{ref}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg$$





$$\bar{c}_{p}(T) = a_{1} + a_{2}T + a_{3}T^{2} + a_{4}T^{3}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{c}_{v}(T) = b_{1} + b_{2}T + b_{3}T^{2} + b_{4}T^{3}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{u}(T) = \left(b_{1}T + \frac{b_{2}T^{2}}{2} + \frac{b_{3}T^{3}}{3} + \frac{b_{4}T^{4}}{4}\right)_{T_{ref}}^{T}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{h}(T) = \left(a_{1}T + \frac{a_{2}T^{2}}{2} + \frac{a_{3}T^{3}}{3} + \frac{a_{4}T^{4}}{4}\right)_{T_{ref}}^{T} + \bar{R}T_{ref}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{s}^{\circ}(T) = \left(a_{1}\ln(T) + a_{2}T + \frac{a_{3}T^{2}}{2} + \frac{a_{4}T^{3}}{3}\right)_{T}^{T} + \bar{s}_{ref}^{\circ}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \therefore$$





$$\begin{split} \bar{c}_p(T) &= a_1 + a_2 T + a_3 T^2 + a_4 T^3, & T_{min} \leqslant T \leqslant T_{max} & \neg \\ \bar{c}_v(T) &= b_1 + b_2 T + b_3 T^2 + b_4 T^3, & T_{min} \leqslant T \leqslant T_{max} & \neg \\ \bar{u}(T) &= \left(b_1 T + \frac{b_2 T^2}{2} + \frac{b_3 T^3}{3} + \frac{b_4 T^4}{4}\right)_{T_{ref}}^T, & T_{min} \leqslant T \leqslant T_{max} & \neg \\ \bar{h}(T) &= \left(a_1 T + \frac{a_2 T^2}{2} + \frac{a_3 T^3}{3} + \frac{a_4 T^4}{4}\right)_{T_{ref}}^T + \bar{R} T_{ref}, & T_{min} \leqslant T \leqslant T_{max} & \neg \\ \bar{s}^\circ(T) &= \left(a_1 \ln(T) + a_2 T + \frac{a_3 T^2}{2} + \frac{a_4 T^3}{3}\right)_{T}^T + \bar{s}_{ref}^\circ, & T_{min} \leqslant T \leqslant T_{max} & \therefore \end{split}$$

• Verificação de limites;





$$\bar{c}_{p}(T) = a_{1} + a_{2}T + a_{3}T^{2} + a_{4}T^{3}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{c}_{v}(T) = b_{1} + b_{2}T + b_{3}T^{2} + b_{4}T^{3}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{u}(T) = \left(b_{1}T + \frac{b_{2}T^{2}}{2} + \frac{b_{3}T^{3}}{3} + \frac{b_{4}T^{4}}{4}\right)_{T_{ref}}^{T}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{h}(T) = \left(a_{1}T + \frac{a_{2}T^{2}}{2} + \frac{a_{3}T^{3}}{3} + \frac{a_{4}T^{4}}{4}\right)_{T_{ref}}^{T} + \bar{R}T_{ref}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{s}^{\circ}(T) = \left(a_{1}\ln(T) + a_{2}T + \frac{a_{3}T^{2}}{2} + \frac{a_{4}T^{3}}{3}\right)_{T}^{T} + \bar{s}_{ref}^{\circ}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \therefore$$

- Verificação de limites;
- Coef./func. próprios; e





$$\bar{c}_{p}(T) = a_{1} + a_{2}T + a_{3}T^{2} + a_{4}T^{3}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{c}_{v}(T) = b_{1} + b_{2}T + b_{3}T^{2} + b_{4}T^{3}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{u}(T) = \left(b_{1}T + \frac{b_{2}T^{2}}{2} + \frac{b_{3}T^{3}}{3} + \frac{b_{4}T^{4}}{4}\right)_{T_{ref}}^{T}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{h}(T) = \left(a_{1}T + \frac{a_{2}T^{2}}{2} + \frac{a_{3}T^{3}}{3} + \frac{a_{4}T^{4}}{4}\right)_{T_{ref}}^{T} + \bar{R}T_{ref}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \neg \\
\bar{s}^{\circ}(T) = \left(a_{1}\ln(T) + a_{2}T + \frac{a_{3}T^{2}}{2} + \frac{a_{4}T^{3}}{3}\right)_{T}^{T} + \bar{s}_{ref}^{\circ}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \therefore$$

- Verificação de limites;
- Coef./func. próprios; e
- Produtos matriciais.





