C.01.01.Z1 – Biblioteca Simplificada de Gás Ideal

Aplicação em FTHA – Finite Time Heat Addition Otto Engine Model

Prof. C. Naaktgeboren, PhD

https://github.com/CNThermSci/ApplThermSci
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Equação de Estado (EoS): Comportamento $P-T-v$

$$Pv = RT \qquad P\bar{v} = \bar{R}T \qquad \rightharpoondown$$

$$P = \frac{RT}{v} \qquad P = \frac{\bar{R}T}{\bar{v}} \qquad \rightharpoondown$$

$$T = \frac{Pv}{R} \qquad T = \frac{P\bar{v}}{\bar{R}} \qquad \rightharpoondown$$

$$v = \frac{RT}{P} \qquad \bar{v} = \frac{\bar{R}T}{P} \qquad \therefore$$

Cada equação com forma nas bases **mássica**, e **molar**, com $R = \bar{R}/M$ — armazenar $\bar{R}$ e M!

Modelo de $\bar{c}_p(T)$ Polinomial: $\bar{u}(T)$ e $\bar{h}(T)$

$$\bar{u}(T) = \int_{T_{ref}}^{T} \bar{c}_v(T), \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \rightharpoondown$$

$$\bar{c}_p(T) = a_1 + a_2T + a_3T^2 + a_4T^3, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \rightharpoondown$$

$$\bar{c}_v(T) = \bar{c}_p(T) - \bar{R} = \sum_{i=1}^{4} b_iT^{i-1}, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \rightharpoondown$$

$$b_1 = a_1 - \bar{R}, \qquad b_{i>1} = a_{i>1} \qquad \therefore$$

Armazenar a_i, T_{min} e T_{max} e saber as **conversões** (i) $a_i \to b_i$ e (ii) $\bar{c}_{p,v}(T) \to c_{p,v}(T)$.

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