

Memo 7

DIVERSIFIED CHEMICAL PRODUCTS
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SUBJECT: Physical Property Data for Lucretex Components

This memo provides physical property data for all the components in the case-study. Table 1 contains pure-component property values.

Models for Temperature-Dependent Pure-Component Properties (see Table 2)

Ideal Gas Heat Capacity ($\text{J kmol}^{-1} \text{K}^{-1}$):

$$C_{p,ig} = A_1 + A_2T + A_3T^2 + A_4T^5 + A_5T^4 + A_6T^5 \quad A_7 \leq T \leq A_8$$

$$= A_9 + A_{10}T^{A_{11}} \quad T < A_7$$

Extended-Range Antoine Equation for Vapor Pressure (N m^{-2}):

$$\ln P_s = B_1 + \frac{B_2}{T + B_3} + B_4T + B_5 \ln T + B_6T^{B_7} \quad B_8 \leq T \leq B_9$$

Binary Wilson Model for Activity Coefficients (see Table 3)

The liquid interactions between components i and j are represented by the Wilson liquid solution model in the following form:

$$\ln \gamma_i = 1 - B_i - \sum_{j=1}^n e^{a_{ji} + \frac{b_{ji}}{T} - B_j} x_j$$

$$B_i = \ln \left[\sum_{j=1}^n e^{a_{ij} + \frac{b_{ij}}{T}} x_j \right]$$

where γ_i denotes the activity coefficient of component i, a_{ij} and b_{ij} represent binary interaction parameters between component pairs (i, j), and T denotes the temperature (in kelvins) of the system. All available binary interaction parameters are shown in Table 3.