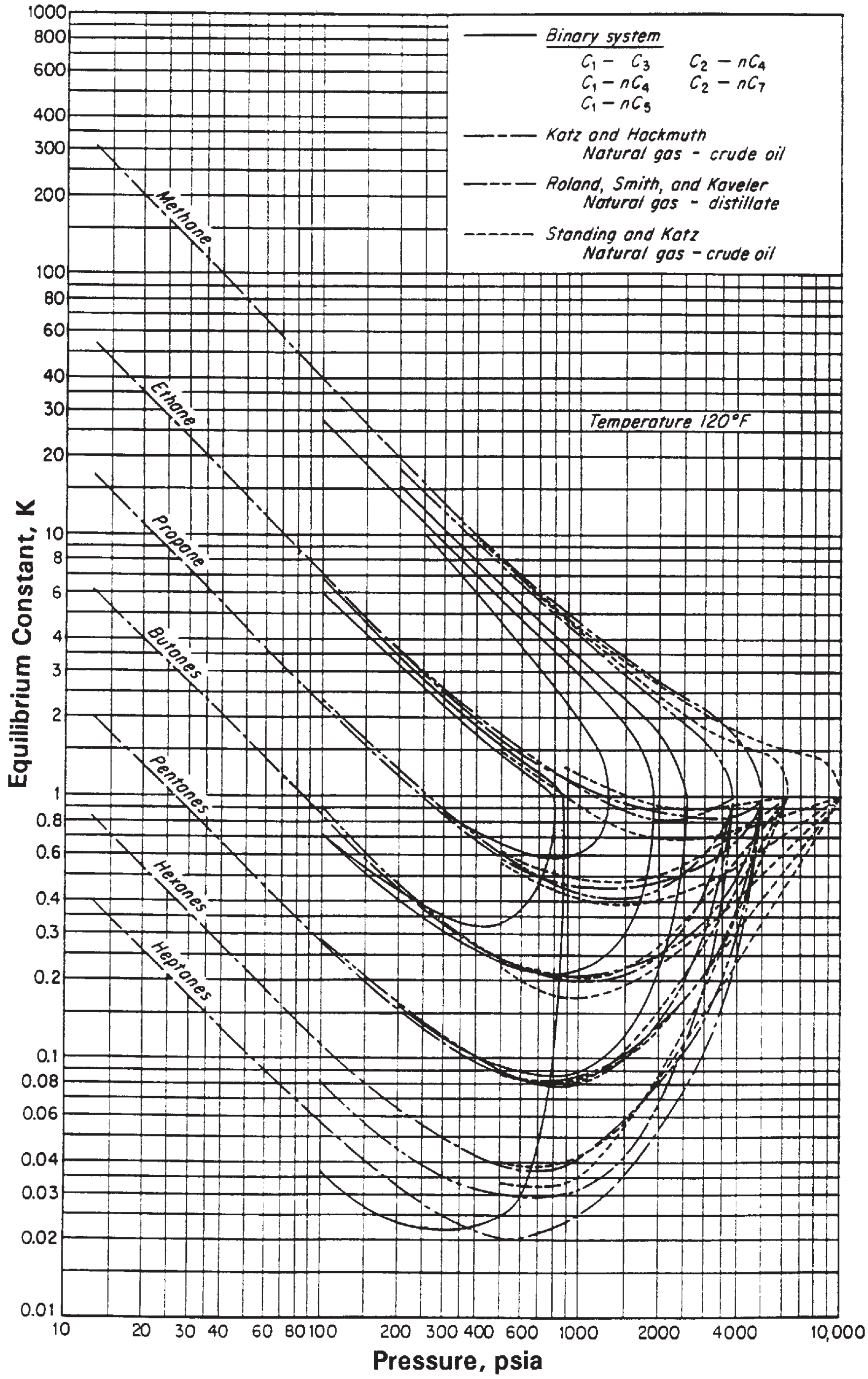

Fig. 3.25—*K* values at 120°F for binary- and reservoir-fluid systems with convergence pressures ranging from 800 to 10,000 psia (from Standing[3]).

K values tend toward unity as pressure approaches the convergence pressure, p_K, it is necessary that $A_0 = \log(p_K)$ and $A_1 \rightarrow 0$. Several authors have noted that plots of $\log(K_i p)$ vs. F_i tend to converge at a common point. Brinkman and Sicking[101] suggest that this "pivot" point represents the convergence pressure where $K_i = 1$ and $p = p_K$. The value of F_i at the pivot point, F_K, is easily shown to equal $\log(p_K/p_{sc})$.

It is interesting to note that the well-known Wilson[102,103] equation,

$$K_i = \frac{\exp 5.37(1 + \omega_i)\left(1 - T_{ri}^{-1}\right)}{p_{ri}}, \quad \ldots\ldots\ldots\ldots\ldots \quad (3.157)$$

is identical to the Hoffman *et al.*[99] relation for $A_0 = \log(p_{sc})$ and $A_1 = 1$ when the Edmister[104] correlation for acentric factor equation,

$$\omega_i = \frac{3}{7}\,\frac{T_{bi}/T_{ci}}{1 - T_{bi}/T_{ci}}\,\log\left(p_{ci}/p_{sc}\right) - 1, \quad \ldots\ldots\ldots\ldots \quad (3.158)$$

is used in the Wilson equation. Note that $5.37 = (7/3)\ln(10)$.

Whitson and Torp[100] suggest a generalized form of the Hoffman *et al.*[99] equation in terms of convergence pressure and acentric factor.

$$K_i = \left(\frac{p_{ci}}{p_K}\right)^{A_1 - 1} \frac{\exp\left[5.37\,A_1\,(1 + \omega_i)\left(1 - T_{ri}^{-1}\right)\right]}{p_{ri}}, \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3.159)$$

where A_1 = a function of pressure, with $A_1 = 1$ at $p = p_{sc}$ and $A_1 = 0$ at $p = p_K$. The key characteristics of *K* values vs. pressure