

1. Problem 3.43 from Smith, Van Ness and Abbott

To a good approximation, what is the molar volume of ethanol vapor at 480°C and 6,000kPa?

$$T_c = 512.6 \text{ K} \quad P_c = 80.97 \text{ bar} \quad \omega = 0.645$$

How does this result compare with the ideal-gas value?

2. A 125 cm³ cylinder is rated at 200 atm. It presently contains 1 mole of methane at room temperature. If the temperature is raised to 50 °C, will the cylinder rupture? Use the ideal gas equation, and the Redlich-Kwong correlation. Why not use the simple Generalized Pitzer Correlations? What would the Generalized Pitzer Correlations predict?

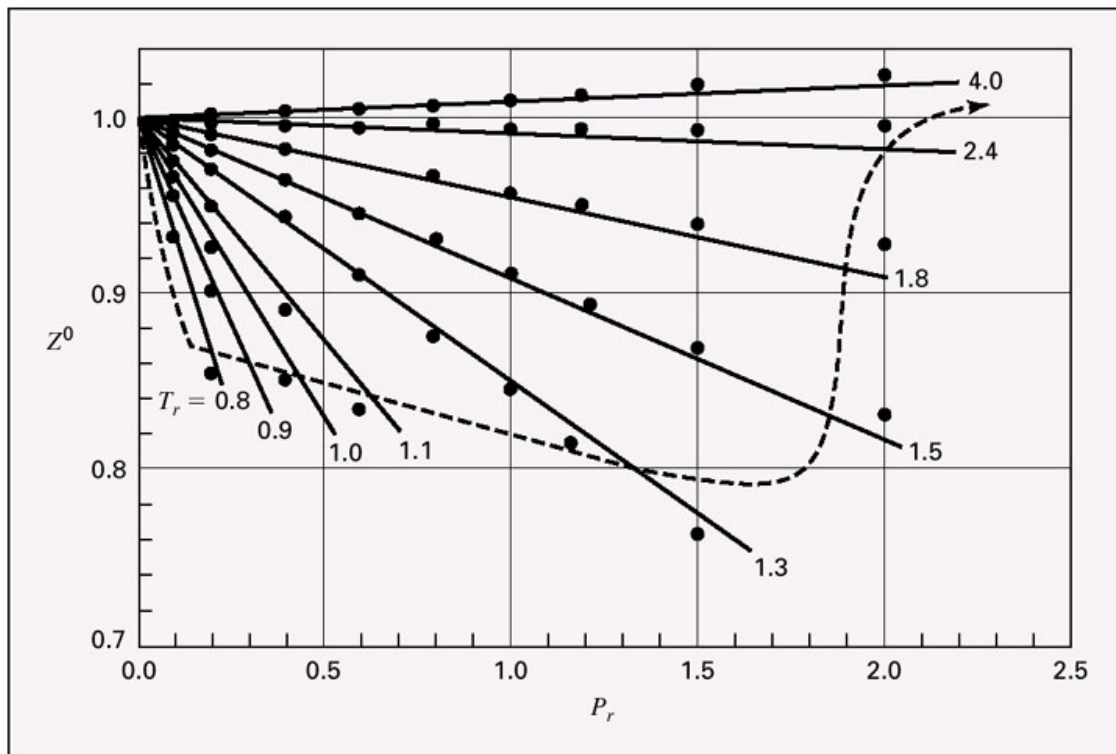


Figure 3.14: Comparison of correlations for Z^0 . The virial-coefficient correlation is represented by the straight lines; the Lee/Kesler correlation, by the points. In the region above the dashed line the two correlations differ by less than 2%.