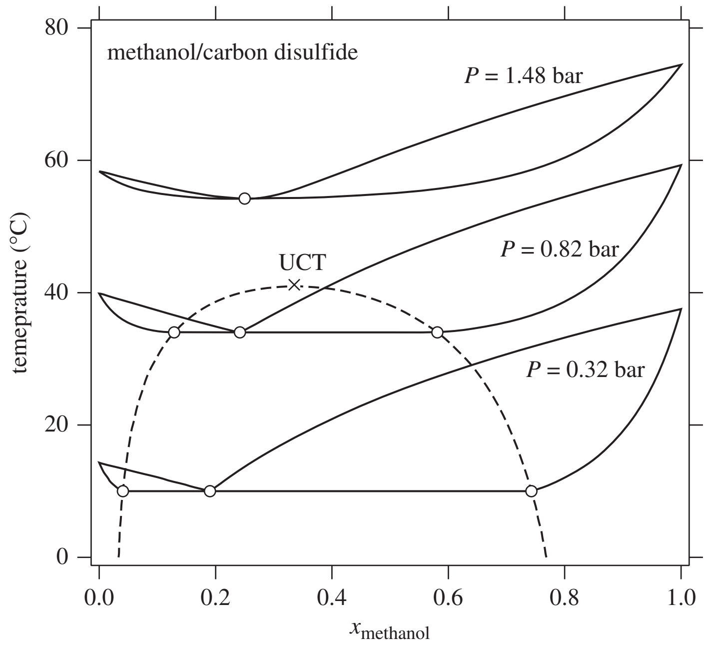

Figure 13-6: *Txy* graphs of methanol/carbon disulfide at various pressures. Above the upper consolute temperature (UCT) the system exhibits full miscibility (see Example 13.3).

temperature increases as well, and a similar calculation would reveal that the liquid-liquid boundary extends to even higher temperatures, until the new bubble point is reached. This behavior is seen in Figure 13-6, which shows the *Txy* graph of methanol/carbon disulfide at three different pressures. For this system, increasing temperature results in increased mutual solubility, as indicated by the convergence of the two liquid branches (dashed line). At the point where the two meet, full miscibility is restored: above the temperature of this point the two liquids are miscible at all compositions. This temperature is called *upper consolute temperature* (UCT) and is very much analogous to the critical point of a vapor/liquid mixture in the sense that the two phases become indistinguishable at this point. Above

UCT

the UTC the two components form a homogeneous minimum boiling azeotrope. The relationship between partial miscibility and minimum-temperature azeotropy is not coincidental. Nonideal systems that exhibit positive deviations from ideality indicate unfavorable cross-interaction between components. When mixed they form solutions that have a higher tendency to erase the interaction by forming a vapor at lower temperature than the boiling point of the pure components. If the cross-interaction is sufficiently strong, then the system exhibits phase separation,