



Figure 9.1 Idealized binary diagram for a two-component liquid system having an upper critical point.

two phases at 100°C, with one of the liquid layers having the composition 85% A and 15% B, and the other liquid layer having the composition 20% A and 80% B. The constant-temperature line that connects these three colinear composition points is called a tie line. For binary systems, all of the tie lines are understood to be parallel (i.e., constant temperature) and need not be drawn. Thus, for any composition at 100°C within the two-phase region, the composition of one liquid layer will be 85% A and 15% B, whereas the other liquid layer will have the composition 20% A and 80% B. The only difference will be the relative amount of each of these phases as one moves along the tie line.

To calculate the amount of each layer, remember that the weights of liquid layer 1 ( $m_1$ ) and liquid layer 2 ( $m_2$ ) must add up to the total weight of the sample, thus