



Figure 9.12 Detail of the three-phase region shown in Figure 4. Composition of each phase is given by the phase boundary–tie line intersection, and the amount of each phase is proportional to the distances shown. See text for explanation.

71% A, 12% B, and 17% C; 2.23 g of phase β with a composition of 63% A, 19% B, and 18% C; and 3.32 g of phase γ with a composition of 61% A, 7% B, and 32% C.

Ternary diagrams can also be used to identify critical solution behavior. Critical states of mixtures are considered to be the condition at which the properties of coexisting liquid phases become indistinguishable, that is, the point at which the interface between the phases disappears. In simplest terms consider the phase behavior in Figure 13. The initial composition of 50% A and 50% B will result in a sample with roughly equivalent volumes (depending on density) of the immiscible liquids A and B. As the third liquid component, C, is added, the location of the tie lines show that C will be equally distributed between the immiscible liquids A and B. The volumes of each phase will increase with the addition of C until the point at which the single-phase boundary is crossed. At this point, the *critical point*, the interface disappears between the two phases of roughly equivalent volume.

With this understanding of how to read triangular plots, a few examples of how these diagrams have been utilized for pharmaceutical formulations is warranted. The biologically compatible system,