9.34 We are given a hypothetical eutectic phase diagram for which \( C_{\text{eutectic}} = 64 \text{ wt\% B} \), \( C_{\alpha} = 12 \text{ wt\% B} \) at the eutectic temperature, and also that \( W_{\beta}' = 0.367 \) and \( W_{\beta} = 0.768 \); from this we are asked to determine the composition of the alloy. Let us write lever rule expressions for \( W_{\beta}' \) and \( W_{\beta} \):

\[
W_{\beta} = \frac{C_0 - C_{\alpha}}{C_{\beta} - C_{\alpha}} = \frac{C_0 - 12}{C_{\beta} - 12} = 0.768
\]

\[
W_{\beta}' = \frac{C_0 - C_{\text{eutectic}}}{C_{\beta} - C_{\text{eutectic}}} = \frac{C_0 - 64}{C_{\beta} - 64} = 0.367
\]

Thus, we have two simultaneous equations with \( C_0 \) and \( C_{\beta} \) as unknowns. Solving them for \( C_0 \) gives \( C_0 = 75 \text{ wt\% B} \).