After the main sequence, the now-inert cores of low-mass stars (*M* ≤ 1.5 *M*\_sun) become degenerate. The hydrogen-rich shell around the core ignites, causing the outer layers of the star to expand. The star is now on the red giant branch (RGB). During the initial stages on the RGB, the star undergoes a significant mixing event, known as the first dredge-up, in which the convective behaviour of the outer regions extends inwards almost to the H-burning shell. This means that the outer layers will display features typically found in fusion regions. However, measurements of the abundance of certain elements e.g. X and Y on the surfaces of stars at later stages of the RGB, shows deviations from ?? expected values?? . It is hypothesised that thermohaline mixing, an effect already known in oceanography and related laboratory tests, is responsible this difference, due to a molecular weight gradient inversion from 3He fusion. The present work studies the extent to which this effect can explain the measured deviations in X and Y, by calculating the coefficients of diffusion due to thermohaline mixing based on parameters from the FRANEC stellar evolution code for a 1 *M*\_sun star at solar metallicity. Estimated diffusion coefficients are plotted as functions of radius for different luminosities. They are then compared to the abundance gradient of 3He and other elements which trace the location of the fusion shell. It is shown that the peak values of the coefficients are similar to values obtained by others. In particular, the peak values of the diffusion coefficients are found to grow over time in regions where thermohaline mixing is significant, which is where 3He is being burnt, just outside the H-burning shell.