In lithium borate fusion, the “acidity concept” is the main factor that determines whether or not a fusion bead will be successful.

Solubility in borate beads of a number of oxides as a function of Lithium Tetraborate-Metaborate mixtures have been shown by the author (2004). They clearly indicate that high acidity oxides behave very differently from low acidity (basic) oxides, as well as oxides of intermediate acidity.

That led the author (1997) to define an acidity scale for oxides that is more practical for Lithium borate glasses than the Smith (1947) acidity scale derived from thermodynamics. From it, the optimal flux composition for a sample can be predicted.

In practice, although calculation of the “acidity index” of a given complex sample is not difficult, it is tedious, and is not spontaneously accepted by analysts in the majority of laboratories, so that the flux composition to use with a sample is usually only estimated. The acidity index of any sample can now be determined rapidly by a simple-to-use software that also suggests the flux composition that fits the sample better, among the five easily commercially accessible flux compositions.

The Claise Calculator (2006) has also been successfully used for finding:
- a fundamental explanation for using the optimal flux composition to make fusion beads;
- a reason why fused beads of transition metals oxides are those that stick more to moulds.

References:
Claise F. (2006) fernandclaisse.com Website