

XRF Scientific Ltd

Advantages of 1.2:2.2 over 100% lithium tetraborate x-ray flux

1. 1.2:2.2 dissolves silica easily whereas silica is difficult to dissolve with 100% lithium tetraborate.
2. The addition of lithium metaborate to the 1.2:2.2 x-ray flux formulation decreases the temperature of fusion and therefore permits better homogeneous dissolution of the oxides in the melt.
3. The selected temperature of fusion has to be higher by 150 - 200° C. than the fusion temperature of the flux used in order to maintain a very homogeneous solution. With 1.2:2.2 having a significantly lower fusion temperature than 100% lithium tetraborate the heating apparatus and the platinum ware life is greatly prolonged.
4. The lower fusion temperatures with 1.2:2.2 means that the loss of volatile elements such as sulphur and volatile oxides such as Na₂O, K₂O, SO₃ etc is decreased.
5. The fusion temperature must be less than 1250° C. to avoid evaporation of Li₂O and this is much easier to achieve with 1.2:2.2.
6. Bad dissolution during fusion causes crystallisation and cracking of the glass discs. By using 1.2:2.2 the temperature range for fusion is much wider therefore there is a decreased chance of disc problems.
7. Bubbles in the middle of the bead are the result of too low fusion temperature. Using lithium tetraborate the fusion temperature range between avoidance of bubbles and loss of volatiles is much less than by using 1.2:2.2.
8. The particle size range of 1.2:2.2 is designed to make optimum contact between the sample and flux achieving better dissolution over opposition products together with the elimination of dust (health hazard).
9. With sodium nitrate additions to 1.2:2.2, the sodium nitrate is screened to be the same size as the 1.2:2.2 flux thereby ensuring homogeneity within the flux /sodium nitrate mixture.
10. X-ray Flux Pty Ltd 1.2:2.2 is being used with great success in fully automated robotic systems.