

THE CARE AND MAINTENANCE OF LABORATORY PLATINUM WARE

D. Verbeeten, XRF Scientific, 88 Guthrie St, Osborne Park, Western Australia 6017

The care and maintenance of platinum ware in the XRF laboratory is a very important step for successfully preparing fusion beads. Notwithstanding their intrinsic value, crucibles and moulds need to be treated with care to produce good quality and uniform glass disks. Although inert to chemical reactions of fusion mixtures, many detrimental effects of sample reactions or mishandling can be fatal to a platinum crucible. Contact with metals or non-oxidised materials will readily cause reaction with platinum alloys at fusion temperatures resulting in 'corrosion' and cracking.

Since X-ray intensity is inversely proportional to the distance between the sample surface and detector, the flatness of a bead is critical in gaining reproducible accurate results. If the glass bead is not perfectly flat, the variation causes a change in x-ray intensity which in turn causes a change in the result. From experiments, a 0.1mm variation will cause a 1% relative change in result. Loss of flatness can be due to a number of factors such as concaving (sagging) caused by gas machines, convexing caused by induction machines and the 'doughnut' effect which is caused by inconsistent polishing. Therefore the maintenance of the mould surface is very important in casting flat beads that do not stick or crack.

Good laboratory labware maintenance practices will be presented along with examples of platinum ware failures and fusion conditions to avoid.