Results in Table III are of general interest to the garnet crystal grower. They show the effect of gas species and pressure on the incorporation of impurities in the crystals and are the subject of a future publication.

Conclusions

It is possible for platinum ware to have a long life and no mechanical failures if some care is taken by crystal growers as follows:

(1) At all times handle the platinum ware with gloved hands.

(2) Premelt the fluxes *slowly* in an oxygen atmosphere and preferably in a resistance-heated furnace, and also check the stoichiometry of the starting compounds used.

(3) Use platinum-lined rhodium-platinum alloy double-walled crucibles for strength, but preferably for limited periods to reduce the risk of rhodium contamination of the melt.

(4) From the point of view of corrosion of the apparatus and volatility, the use of barium salt fluxes has to be considered.

(5) The use of a gas atmosphere different from air has to be considered, since it plays a role in the attack on the platinum.

Finally, it is suggested that the leaching acids should be retained because it may be economic to reclaim the dissolved platinum.

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The Reliability of Dry Reed Switches

The dry reed switch is in general a highly reliable device, the inert gas contained in the glass capsule preventing any undesirable reactions that might affect contact behaviour. Because of their excellent resistance to erosion, rhodium plated contacts are commonly used on the reeds. However, the purity of the gases in the capsule may still be a cause of uncertainty, and an investigation of the effects of such impurities on the contact resistance of rhodium was reported to the 19th Annual Holm Seminar on Electric Contact Phenomena in Chicago by Hayashi, Tanaka and Hara of Fujitsu Laboratories, Kawasaki.

Gaseous impurities that can exist in the capsule included oxygen, methane and carbon dioxide, arising either from atmospheric contamination of the sealing gas or from adsorbed gases on the walls of the glass or on the reeds. The effects of these gases, in varying concentration in purified nitrogen, on the contact resistance of electrodeposited rhodium were measured, while the contact surfaces were checked for impurities by electron probe micro-analysis.

In the presence of oxygen in concentrations as low as 50 p.p.m. in nitrogen contact resistance was found to increase, while a similar effect was given by methane, and oxygen and carbon were respectively detected at the mating point of the contacts. Carbon dioxide did not appear to affect contact resistance even after many operations. Hydrogen, of course, led to no increase in contact resistance, but brought the value back to normal after operation in oxygen or methane.

Similar results were obtained in experiments using bulk rhodium instead of an electrodeposit, and an improved sealing technique to avoid contamination is discussed.