apparatus consists of a conventional argon-purged glove-box. A stainless steel furnace well, fastened to the side, extends into a resistance-heated furnace. Crucibles of Pt or vitreous carbon are attached to the end of a crucible rod which slides into the well. The melt is cast into various forms in a bronze mold, preheated to 50°C below the glass transition temperature of the material. The rapidly-quenched glass is also annealed in the mold.

Investigation into the ZrF_4-BaF_2-ThF_4 and ZrF_4-BaF_2-LaF_3 ternary systems revealed the existence of a vitreous area in a relatively broad range. Attempts at improving glass stability were made by doping additives into the base composition. In these zirconium fluoride glasses, LiF, NaF, or AlF_3 act as network stabilizers and proved useful for suppression of devitrification or for extension of glass working range.

IR spectra in the range 2.5-8.0 microns were recorded on unpolished and polished samples in order to distinguish between absorption due to internal OH and surface OH. This absorption, which extends over the range 2.7-3.6 microns, will have to be eliminated.

The correlation between the intrinsic multiphonon absorption and the glass composition was treated and explained in a theoretical setting.

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CORROSION OF FLUORIDE GLASS IN WATER AND THE EFFECTS OF RE-MELTING

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Fluoride glasses have several important advantages over conventional silica-based glasses in optical fiber technology. However fluoride glasses are generally considered much more susceptible to attack by water [1].

Preliminary experiments were undertaken in order to find out whether significant improvements in fluoride glass durability can be achieved by modifying the glass composition and the method of preparation. Initial results demonstrate that such improvements are

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indeed possible and that they may obviate, to some extent, the need to enclose fluoride glass fibers in completely water-impermeable coatings in order to protect them against rapid deterioration in water-containing environments.

Measurements were recently carried out on a 6-component fluoride glass. The glass composition was determined by means of dc plasma spectrometry. The leach tests were carried out according to the procedure outlined in Ref. 1. The results show that re-melting in the absence of NH_4HF_2 leads to the formation of a much more durable glass than that obtained by single-stage melting. The presence of traces of bifluoride is probably the cause of the enhanced corrosion of non-remelted samples since it introduces an acidic species into the glass.

REFERENCE:

[1] Simmons, C. J., Sutter, H., Simmons, J. H. and Tran, D.C., Mater. Res. Bull. 17, 1203 (1982).

JOINING OF ALUMINUM PLATES BY EPOXY RESIN. I. FRACTOGRAPHY, ADHESION QUALITY AND PROPERTIES OF JOINTS [1]

A. Raveh, B. Herrmann and E. Rabinovitz

Joints of aluminum plates joined by epoxy resin, type Scotchcast, were characterized. The strength of the joints was examined close to joining time and after various storage periods, up to three years. The surfaces of the failed aluminum plates were examined visually as well as by optical microscopy. Three types of failures were characterized: adhesive, cohesive and mixed. Specimens that were examined a short time after joining showed a trend to cohesive failure, while those stored for a certain period showed a trend to adhesive failure. The properties of the epoxy resin components (viscosity, epoxy equivalent) were determined and it was found that they vary during storage.

REFERENCE:

[1] Raveh, A., Herrmann, B. and Rabinovitz, E., NRCN-543, 1984, in Hebrew.

JOINING OF ALUMINUM PLATES BY EPOXY RESIN. II. CHARACTERIZATION OF THE JOINTS [1]

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Specimens of aluminum plates were subjected to various surface