tive in preventing formation of either of those structural imperfections associated with trapped electrons or positive holes holes. As to the valency changes of cerium ion itself, a small part of trivalent cerium ions was found to loose their electron upon irradiation by the reaction

$$Ce^{3+} + h\nu \rightarrow [Ce^{3+} \text{ with positive hole}] + e^{-}.$$

Use of Ordinary Plate Glass as a Gamma-Ray Dosimeter

Megumi TASHIRO, Sumio SAKKA and Naohiro SOGA

Yogyo Kyokaishi (Journal of the Ceramic Association, Japan), **68**, 191 (1960)

The gamma-ray dose rate distribution in a small closed space, 80mm in dia., 110mm in height, was determined by the use of small pieces of ordinary plate glass, 15×6×1.72mm, as a dosimeter. The technique of the measurement was described. The advantageous features of the glass dosimeter, i.e., its small size, convenient usage, and preciseness in the measurement, were discussed. A brief description of the construction of a small Co-60 irradiator, in which the measurement was made, was appended.

Mechanicel Strength of Polycrystalline Materials Propuced from Platinum Containing Glasses

Megumi TASHIRO, Sumio SAKKA and Masamichi WADA

Yogyo Kyokaishi (Journal of the Ceramic Association, Japan), **68**, 223 (1960)

Rindone found that a small amount of platinum (0.01%) introduced into a glass of the composition $Li_2O \cdot 4SiO_2$ acts as a nucleating agent on reheating, converting the whole mass into an assembly consisting of extremely small crystals (G. E. Rindone, *J. Am. Ceram. Soc.*, **41**, 41 (1958)).

This paper presents the results of the investigation of authors which covers the nucleation by platinum for glasses contaning Li_2O, MgO, Al_2O_3, and SiO_2. The bending strength was used for the evaluation of the effect of the nucleating agent.

(1) **Optimum amount of platinum.** The glasses of the composition, Li_2O 12.5, K_2O 2.5, Al_2O_3 4, SiO_2 81% by weight, added, respectively, with 0, 0.001, 0.01, 0.1% of platinum were formed into the specimens of the size 50×5×2.5mm. Taking the density increase as a reference the effect of the concentration of platinum on the devitrification of the specimens under a stepwise heat treatment was investigated. It was found out that 0.01% was sufficient for the completion of devitrification.

The bending strength of the devitrified specimen increased with increasing platinum content. Taking into consideration of the cost of platinum the authors

concluded that 0.01% is the optimum amount for nucleation from practical standpoint.

(2) **The influence of lithium content.** The glass of the composition, MgO 15, Al_2O_3 23, SiO_2 62=100+$X$$Li_2O$, where$X$=4, 6, 8, 12, by weight, was melted with and without addition of 0.01% platinum. The specimens of the same size as above were heated from room temperature to 1050-1100°C with the rate of 5°C/min., and then kept consstant for one hour. The bending strength of platinum containing glasses increased remarkably when their lithium content was high (12%), whereas only a negligibly small increase was found in the glasses of low lithium content below 6%. This indicates clearly that the function of platinum was influenced by the amount of lithium in glass.

It was also confirmed that the glasses of low lithium content could be converted into a polycrystalline material of high mechanical strength even when no platinum was added. The investigation of this interesting phenomenon is now going on.

(3) **The optimum composition range in the sysem Li_2O-MgO-Al_2O_3-SiO_2.** Keeping Li_2O at a constant value of 12% other components were changed as; MgO x, Al_2O_3 y, SiO_2 z, where x, y, z are mole ratio by weight and $x+y+z=100$, the range in which the two conditons, (a) glass may be obtained at a melting temperature lower than 1400°C, (b) the glass converts into the polycrystalline material without any noticeable deformation during the reheating will be satisfied. The range in which the condition (a) was satisfied was x: 0-30, y: 0-30, z: 60-100, and that of satisfying (b) was x: 0-20, y: 0-30 and z: 60-100.

Studies on the Fluorometric Analysis. (XII)

Fluorometric Determination of Aluminium by the Extraction of its Pontachrome Blue Black R Complex with Amylalcohol An Application to the Analysis of Pure Magnesium

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Nippon Kagaku Zasshi (Journal of the Chemical Society of Japan, Pure Chemisty Section), 81, 259 (1960)

A fluoometric method for the micro-determination of aluminium based on the extraction of the Pontachrome Blue Black R complex with amyl alcohol was investigated.

Pontachrome Blue Black R reacts with aluminium to form a stable complex compound which shows an intense red fluorescence by ultraviolet light, with illumination and so the reaction has been used for the fluorometric analysis of aluminium. As the complex is easily extracted with amyl alcohol from an aqueous solution with pH 4.8-5.4, the sensitivity of the method can be increased and the influence of the quenching substances can be avoided, by the application of the solvent extraction.

The fluoresence of the complex in organic medium shows almost the same