49. A Method of Measuring Ion Mobility Using an Alpha-ray Counter.

Kazunori Yuasa and *Ryutaro Ishiwari.*

As an application of the analysis of the pulse shape of alpha-ray counter, a method of measuring ion mobility of gas filled in the ionization chamber is described.

Since the output pulse height of the alpha-ray counter is represented by a function of the ion mobility of the gas according to the results of the analysis, we can estimate the value of the ion mobility by measuring the pulse height. A convenient device for the ionization chamber and the formula for the method are described in detail.

As an application of this method, the relation of the mobility to the age of ions and the effect of humidity were investigated in case of air. For the air dried by $CaCl_2$, we obtained

$$k_- = 2.2$$

$$k_+ = 1.7 \quad : \text{age} > 1 \times 10^{-3}\ \text{sec}$$

$$2.2 \quad : \text{age} < 2.5 \times 10^{-4}\ \text{sec}$$

In the interval from 2.5×10^{-4} sec to 1×10^{-3} sec, fast and slow ions mixed together. As for the effect of humidity, our results were in good agreement with those of Tyndall and Grindly (Tyndall and Grindly, Proc. Roy. Soc., **110**, 341 (1926)).

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50. Application of the Schlieren Method.

The Mode of Covering and the Resolving Power.

Rempei Goto, Tsunekazu Hirota, and *Kihei Urakubo.*

The Schlieren method is a useful means to investigate the small change of the refractive index of transparent materials, and its applications to physics, chemistry, medicine and technology are remarkable now. Then, we also, utilizing a concave mirror, observed the figures of the "Schlieren" of some glass and films, and various modes of covering, changes of the figures were observed and photographed.

The samples used are optical glass, window panes and polyvinyl alcohol-viscose films (mixture of polyvinyl alcohol and viscose solutions, drawn out, and dried). As the light source we set a superhigh pressures 500 W mercury lamp and instead of the focusing lens, a concave mirror was used. (its diameter: 60

cm; the radius of curvature: about 7 m).

The lens behind the covering is that of a Tessar Zeiss camera. (f=40 cm. 1: 4.5) And following modes of covering were used.

1. The edge vertical in front of the light source and the edge vertical in front of the camera lens.

2. The slit horizontal in front of the light source, (3.5 cm in horizontal length, 0.35 cm in vertical length) and the bar-stop.

3. The circular slit (r=0.35 cm) in front of the light source and the circular stop in front of the lens.

Thus we obtained various figures of Schlieren which vary as the mode of covering.

51. Bubbles in Glass. (II)

Deformation of Bubbles in Sheet Glasses.

Masao Mine and *Masatami Takeda*.

The characteristics of the shape of bubbles in the drawn sheet glass were studied to obtain knowledge on their deformation processes in shaping the glass. The relations among the length A, the width B and the thickness C of the typical bubble were found to be expressed as follows:

$$(A/D_0)=(B/D_0)^{N_A}, \qquad (C/D_0)=(B/D_0)^{N_C}$$

The constants N_A and N_C are determined by the type of deformation of glass and the observed value of $N_A=1.8$, $N_C=0.4$ for any drawn sheet glass. On the other hand, the constant length D_0, obtained by extrapolating the linear relations of $\log A : \log B$ and $\log C : \log B$ is determined by the degree of the deformation of glass and the observed value of D_0 for sheet glass of 2 mm thick made by the Colburn process is about 4.3×10^{-4} cm.

Three sections of the typical bubbles observed by microphotograph are found all to be made of curves of parabolic type, but all of these sectional curves lie between ellipse and quadratic parabola with axes of the same length. These results were verified by measuring the volume of fragments of relatively large bubbles by filling mercury therein. The diameter of the sphere having the same volume as the real bubble in sheet glass is estimated to be about 7 % less than that of the sphere having the same volume as the ellipsoide, with three axes, A, B and C.

52. Enamel Defects due to Hydrogen in Steel.

Megumi Tashiro and *Tsuneo Okamura*.

It is well known that hydrogen is absorbed by steel by the pickling operation.