probably arose from the fact that the transmitting fluids, although nominally similar mixtures, were not actually identical, as was apparent from differences of viscosity.

b) Comparison with the similarity method

The most important aspect of the flow method as so far applied is its value as confirmation of the results obtained by the similarity method. This comparison is shown, for the two cases considered, in Tab. 3 and in Figs. 6 and 7. In each case the same piston-cylinder assembly, and the same transmitting fluid, were used in the determinations by the two methods. Although

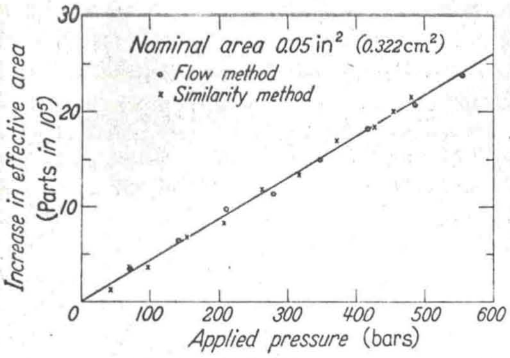

Fig. 6. Comparison of distortion factors determined by the similarity and flow methods. Assembly of type a with mineral oil mixture A

the agreement is very close in both cases, the confirmation is especially important in the case illustrated in Fig. 7 where the pressure, and the corresponding distortion factors, cover the widest range. The flow method confirms not only the value of the distortion coefficient, with agreement to the order 2 or 3% in

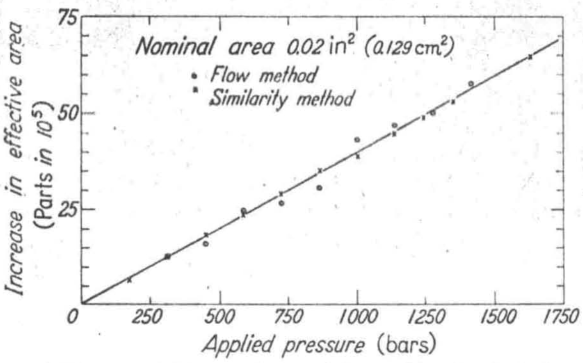

Fig. 7. Comparison of distortion factors determined by the similarity and flow methods. Assembly of type a with mineral oil mixture B

both cases, but also the fact that the distortion term is accurately representable as a linear function of the applied pressure. The flow method shows a slightly increased dispersion of the experimental points, which is believed to be due to residual uncertainties in the temperature of the assembly. It has been noted that the correction terms I_2/I_1 do not differ greatly from unity, but it is found that the inclusion of this correction factor gives a small but definite improvement in the agreement with the similarity method.

The results of these comparisons therefore support the estimate of accuracy of the measured distortion coefficients already arrived at as a result of the discussion in Section 4 b, viz. that these coefficients are determined to about 2%. An error of this magnitude in the distortion coefficient would imply an error of about 1 part in 10^6 in the effective area of the assembly at 1000 bars compared with its value at zero pressure, the error increasing in proportion to the applied pressure.

The very close agreement between the flow method and the similarity method up to the region of 1500 bars suggests that the flow method, or one of the other methods based on the same general principle, may have useful applications in the further extension of this work to higher pressures.

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