

namely, 10^{-6} mm. at $1,800^\circ$ K. Secondly, the rate is independent of coverage; it is thus independent of surface structure and is determined solely by the area exposed to molecular hydrogen. A study of the atomization of hydrogen over platinum and gold supports this view.

We have also studied the atomization of oxygen over platinum using a reduced form of molybdenum oxide as the oxygen-atom trap. Again, \sqrt{P} kinetics are found over an extended pressure-range and the activation energy is accurately $\frac{1}{2}D(O_2)$. Thus the present investigation, the details of which will be published later, support mechanism 1 as the process by which both hydrogen and oxygen are atomized heterogeneously.

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Analysis of Light Hydrocarbon Gas Mixtures

It is a common analytical requirement to separate mixtures containing ethane, ethylene, propane and propylene, and, while gas chromatographic methods have been designed to separate the C_2 and C_3 gases and also the olefines from the saturated compounds, there is not, in our experience, any simple method reported for the resolution of all four gases on one column.

Olefines are cleanly separated from the saturated hydrocarbons on a column packing consisting of a saturated solution of silver nitrate in ethylene glycol supported on graded 'Celite'¹. The C_2 gases are separated from the C_3 by a tri-isobutylene/'Celite' column². Attempts to achieve separations by use of these two columns in series were unsuccessful (Fig. 1a), as were similar attempts by Bodnas and Russell².

The technique of using a physical mixture of these two packings in one column was therefore tried. The two packings, prepared separately as before, were mixed together mechanically; this did not appear to impair their efficiency or useful life in any way. On a W-shaped column, 4 m. long \times 6 mm. internal diameter, separation of all four gases was readily accomplished at room temperature and Fig. 1b shows a typical chromatogram obtained with this mixed packing.

The same mixture was used for each run.

Column dimensions: 4 m. \times 6 mm. internal diameter; carrier gas: 0.4 l./hr. nitrogen; inlet pressure: 758 mm.; outlet pressure: 712 mm.;

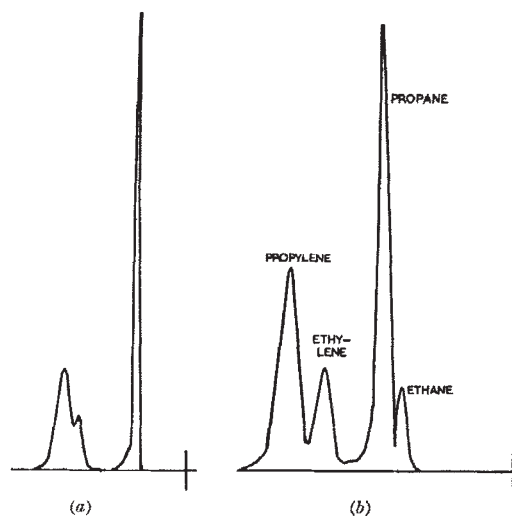


Fig. 1. a, Series columns; b, mixed packing

column and katharometer temperature: 25° C. So far as we are aware this is the first occasion on which the use of such a physically mixed packing has been reported.

Further work has shown that it is also quite possible to separate isobutene from the four gases previously mentioned on the same column.

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Kinetic Isotope Effect in the Bromination of Dimethylaniline

THE recent account by Shilov and Weinstein¹ of a kinetic isotope effect in the iodination of some aromatic amines prompts us to report the observation of a similar effect in the bromination of dimethylaniline.

The absence of a hydrogen isotope effect in the iodine-catalysed reaction between molecular bromine and benzene² shows that the C—H bond at the position of substitution is not appreciably stretched in the transition state, though the bond may have changed its hybrid character from sp^2 to sp^3 , forming the Wheland intermediate³ (I, X = Br). Other studies⁴ have indicated that, in general, the degree to which the Wheland intermediate is formed in the

