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THEORY OF SELECTIVE FILTRATION: PART II

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Research & Development Establishment,
British-American Tobacco Company Ltd.,
SOUTHAMPTON.

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THEORY OF SELECTIVE FILTRATION: PART II

(Report No. RD.370-R)

SUMMARY AND RECOMMENDATIONS

A simple theoretical model has been developed for the processes of filtration by vapour sorption and distillation mechanisms occurring in a fixed bed of solid sorbent. Although the theory shows reasonable agreement with experimental data obtained on the removal, by carbon beds, of aldehydes from cigarette smoke, it requires modification to allow for the reduction of the affinity of the sorbent for any particular smoke component by the sorption of other components.

Therefore, it is proposed that the theory should be extended to allow for the displacement of one smoke component by others. In the first instance, this will be done by considering the displacement of substances which are initially sorbed uniformly on a carbon bed.

This extension of the theoretical study should have two valuable applications.

- (1) As a direct model for a system whereby substances, for example, flavour can be introduced into smoke.
- (2) As a first step in understanding the more complicated pattern of mutual displacement which occurs during filtration.

It is also recommended that further measurements of sorption isotherms and sorption rates should be made for a range of smoke components and carbon samples, in an attempt to correlate these properties with filtrational characteristics.

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