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THE DISTRIBUTION OF SUBSTANCES BETWEEN THE  
VAPOUR AND PARTICULATE PHASES OF CIGARETTE SMOKE  
PART 2: EFFECTS OF COMPOUND TYPE  
AND SOURCE OF SMOKE

REPORT NO. RD.444-R

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THE DISTRIBUTION OF SUBSTANCES BETWEEN THE  
VAPOUR AND PARTICULATE PHASES OF CIGARETTE SMOKE  
PART 2: EFFECTS OF COMPOUND TYPE AND SOURCE OF SMOKE

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SUMMARY AND CONCLUSIONS

A previous report (1) described the measurement of the distributions of cyclic ketones between the vapour and particulate phases of cigarette smoke. In the present work, the method has been extended to measure the distributions of compounds of different chemical type. The effect of tobacco type has also been investigated.

The following conclusions have been reached:

1. For a given compound in a given smoke, the ratio of the concentrations in the vapour and particulate phases is independent of the total amount of compound present.
2. For a given compound type in a given smoke, the concentration ratio increases as the vapour pressure of the pure compound increases.
3. Smoke particulate phase has a greater affinity for molecules with active groups, e.g., carbonyl groups, than for inactive molecules.
4. The distribution of pyridine is not effected by changes of one unit in the pH of the smoke. This result suggests that little or no ionisation of pyridine occurs in smoke, and experiments will be carried out to test this hypothesis.

The next stage of this study will be an investigation of the time taken for a substance added to the vapour phase of smoke to reach an equilibrium concentration in the particulate phase.

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