

ONLY THE TITLE PAGE AND THE SUMMARY PAGE ARE HELD ON THIS FILE

THE FULL REPORT CAN BE SEEN ON APPLICATION TO CENTRAL FILING

FILTRATION OF PNEUMOLS:
LABORATORY REPORT NO. 2
EVALUATION OF CELLULOSE SECONDARY
ACETATE, CELLULOSE TRIACETATE AND
PAPER FILTERS.

LABORATORY REPORT NO. L.72-2.

4.1.63

AUTHORS: H.G. Horswell
G.H. Rayner

WORK BY: J.B. Preston
G. Townley
C. Wintrell

APPROVED BY: I.W. Hughes

ISSUED BY: D.G. Falton

PROJECT NO. 6400

RECOMMENDATION:

J.C.F. Hobson, Esq.	-	Copy No.	1.
Sir Charles Ellis.	-	" "	2.
H.P. Anderson, Esq.	-	" "	3.
R.H. Boothroyd, Esq.	-	" "	4, 5.
T.H. Wade Jan. Esq.	-	" "	6, 7.
L.C. Roberts, Esq.	-	" "	8, 9, 10.
A.W. Reid, Esq.	-	" "	11, 12.
H. Cottonhill, Esq.	-	" "	13.
D.C. Fieldsend, Esq.	-	" "	14.
R. J. D. E. Library.	-	" "	15, 16.
R. & B. B. File 403-9.	-	" "	17.

100096049

17th December, 1952.

FILTRATION OF PHENOLS:
PROGRESS REPORT NO. 2
EVALUATION OF CELLULOSE SECONDARY
ACETATE, CELLULOSE TRIACETATE AND
PAPER FILTERS

(Laboratory Report No. L.72-R).

SUMMARY AND CONCLUSIONS

The filtration efficiency of various commercial diacetate filters towards phenols has been determined. The effect of addition of polyethylene glycol (P.E.G.) and triacetin to these filters has been studied. Cellulose triacetate and paper filters have also been evaluated for phenols removal and a comparison of the efficiencies of filters made by the normal and threaded roll processes has been carried out.

It has been found that:-

1. The filtration efficiency of a paper filter for phenols is only marginally greater than its efficiency for nicotine removal.
2. The addition of either triacetin or polyethylene glycol (P.E.G.) to paper filters increases the filtration efficiency for phenols; approximately 1% of either additive enhances the efficiency by 0.4%. Within the limits of the experiments carried out, this addition has no effect on nicotine removal.
3. The filtration efficiency of cellulose diacetate or triacetate for phenol is greater than for nicotine, and the degree of difference is dependent, in a way as yet unknown, upon the denier specification of the filter.

At equal pressure drop, the threaded roll process does not impart higher filtrational properties than does the normal process.

4. The addition of triacetin or polyethylene glycol to an acetate filter enhances its filtering power for phenols, whilst the filtration efficiency towards nicotine is unchanged. Both additives are equally effective at the same concentration, and, when present in a mixture, act independently and proportionally to their concentrations.

100096050

5. The extent of the increase resulting from the presence of an additive is dependent upon the denier specification of the acetate tow.

6. The filtration efficiency of a given filter towards phenols increases exponentially with the length of the filter and thus the efficiency for any length of that filter can be calculated.

7. Work carried out in the various research centres on filtration of phenols has not been directly comparable, owing to several experimental differences, not the least of which has been the length of tobacco butt left after smoking. Experiments have been carried out in which the effect of tobacco butt length on the filtration efficiency of a synthetic filter has been examined, and it has been shown that,

a. the efficiency is approximately constant for tobacco butt lengths greater than 23 mm.

b. the efficiency increases by approximately 0.6% per mm for tobacco butts less than 23 mm and greater than 8 mm.

In this Report, the term "phenols" refers to those phenols which are steam-volatile and which react with the colour-reagent. This excludes phenols substituted in the para-position to the phenolic group, e.g. p-cresol, 2,4- and 3,4- xlenols.

100096051