Note on the SESQUITERPENE of EUCALYPTUS OILS.

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When an Eucalyptus oil is quantitatively determined for eucalyptol with phosphoric acid a pink or reddish colour is usually given to the mixture. This is particularly the case with the oils of higher specific gravity which consist largely of eucalyptol. The appearance of this reddish colour has often been taken to denote the end reaction for this determination, but the constituent causing it cannot be considered as an indicator for eucalyptol because the greater the proportion of the constituent occurring in a particular oil the sooner the colour will appear.

The constituent of Eucalyptus oils causing this colour reaction with phosphoric acid is a sesquiterpene, and it probably occurs in varying amount in all the oils of the series. In some of these it occurs in great abundance, and over fifty per cent. of the oil of *E. hæmastoma* distilled above 225° C., nor, was this an abnormal sample, because material of this species was obtained from localities nearly one hundred and fifty miles apart, and both the samples of oil were in agreement, indicating that the sesquiterpene follows the general rule with these oils, of identical species of Eucalypts giving practically identical oils irrespective of location. The oils from the following species were also found to contain the sesquiterpene in quantity:—*E. eximia*, *E. nova-anglica*, *E. trachyphloia*, *E. affinis*, *E. maculata*, *E. crebra*, *E. viminalis*, and *E. acmenoides*. It may occur in these oils with either pinene or phellandrene as the principal terpene, and eucalyptol may be either present or absent. There appears to be only one sesquiterpene in Eucalyptus oils, because the product obtained by fractional distillation (finally over sodium) from the mixed higher

boiling portions of several of the oils was practically identical with that obtained from the oil of *E. hæmastoma* in the same manner. Crystallised chemical compounds do not appear easy to produce from it, and attempts to form a crystallised dihydrochloride, a nitrosochloride, or a nitrosite, were unsuccessful, nor did it appear possible to form a solid sesquiterpene alcohol from it. Having thus to rely upon the product obtained by repeated fractional distillation, finally over sodium, it cannot be considered to be sufficiently pure to determine its constants, with certainty, although the results obtained were fairly satisfactory.

The specific gravity of the sesquiterpene from the mixed oils was 0·9229 at 19° C., and of that from *E. hæmastoma* at the same temperature 0·9249. When it shall have been obtained pure it will most probably be found to be inactive to light. It boiled under atmospheric pressure at 260 – 265° C.

An analysis resulted as follows:—0·1366 gram gave 0·4388 gram CO_2 and 0·1502 H_2O, equal to 87·6 per cent. carbon and 12·2 per cent. hydrogen. $C_{15}H_{24}$ requires 88·23 per cent. C. and 11·77 per cent. H.

A vapour density determination, using the vapour of diphenylamine, gave 11·8 cc. of moist air at 19° C. and 754 mm. pressure from 0·1027 gram, indicating a molecular weight of 214. $C_{15}H_{24}$ equals 204.

The most characteristic test of this sesquiterpene is the very fine colour reactions it gives with acids and with bromine. If one or two drops of the sesquiterpene be mixed with 2 or 3 cc. of glacial acetic acid and the vapour of bromine allowed to pass down the tube, immediately it reaches the liquid a crimson colour is formed rapidly passing downwards, if agitated the whole becomes crimson at once, soon changing to violet and in about five or ten minutes it has become of a deep indigo-blue colour, which remains persistent for a long time. A few drops of hydrobromic acid gives the same colour reactions as with bromine, and as a bromide is formed from the sesquiterpene with the evolution

of hydrobromic acid, it is probably to the formation first of this acid that the colour given with bromine is due. Hydrochloric acid gives the same colours, but the reaction is slower.

In a solution prepared as above, sulphuric acid gives a crimson colour at once, soon changing to a purplish colour. Phosphoric acid in the same manner gives first a pink then a crimson and finally a violet colour. These colour reactions are exceedingly delicate.

The evidence so far obtained show this sesquiterpene to have been previously undetermined. It is proposed to give it the name *Aromadendrene* utilising Dr. Andrews' name for the genus.

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