

A SIMPLE METHOD FOR THE ESTIMATION OF BENZOCAINE IN OINTMENTS

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THE analysis of compound ointment of benzocaine, B.P.C. is laborious since it involves titration with sodium nitrite at a controlled temperature of 15° C. or lower, after a preliminary process for the extraction of benzocaine with dilute hydrochloric acid from a solution of the ointment in light petroleum. The end-point of the titration is not very satisfactory as the solution of sodium nitrite needs to be added drop by drop at 5-minute intervals towards the end of the titration. The method to be described involves extraction with dilute hydrochloric acid followed by the determina-

TABLE I
ANALYSIS OF A SIMPLE OINTMENT OF BENZOCAINE (5 PER CENT.
IN SOFT PARAFFIN) BY THE SPECTROPHOTOMETRIC AND B.P.C.
METHODS

Sample	Recovered per cent.	
	Spectrophotometric method	B.P.C. method
A	101.5	102.0
B	100.5	97.9
C	101.0	100.3
D	100.8	98.7
E	100.5	102.3
F	101.2	98.8
Maximum error ..	+ 1.5	+ 2.3
Mean error ..	0.9	1.5

TABLE II
ANALYSIS OF COMPOUND OINTMENT
OF BENZOCAINE B.P.C. BY SPECTRO-
PHOTOMETRIC METHOD

Sample	Recovered per cent.
G	100.8
H	101.1
I	101.3
J	100.6
K	100.2
L	100.9

tion of benzocaine by ultra-violet absorption. Considerable time is saved since no titration is involved and the results obtained in this laboratory show slightly smaller errors than those obtained by the standard procedure of the B.P.C.

Technique

Transfer an accurately weighed quantity of the ointment equivalent to approximately 50 mg. of benzocaine to a 100-ml. flask, add 50 ml. of light petroleum (b.pt. 50° to 60° C.) and warm on a water bath to dissolve the

ointment. Transfer to a separator washing the flask with quantities, each of 10 ml., of dilute hydrochloric acid B.P. and use this acid for the first extraction of the petroleum layer. Repeat the extraction with further quantities, each of 20 ml., of dilute hydrochloric acid. Adjust the bulked acid solutions to 100 ml. with further acid. Take aliquots and dilute 10 times with distilled water for spectrophotometric estimation. The estimation is made at 271 $m\mu$ and the concentration of benzocaine is determined from a standard curve constructed from known dilutions of the drug in 1 per cent. hydrochloric acid using 1 per cent. hydrochloric acid as the blank.

Results

Figure 1 shows the log. molar extinction coefficient of benzocaine in hydrochloric acid solution over the spectral range 240 to 310 $m\mu$ and it will be seen that there is an absorption peak at 271 $m\mu$ which proved to be the most suitable wavelength for the estimation. At this wavelength the

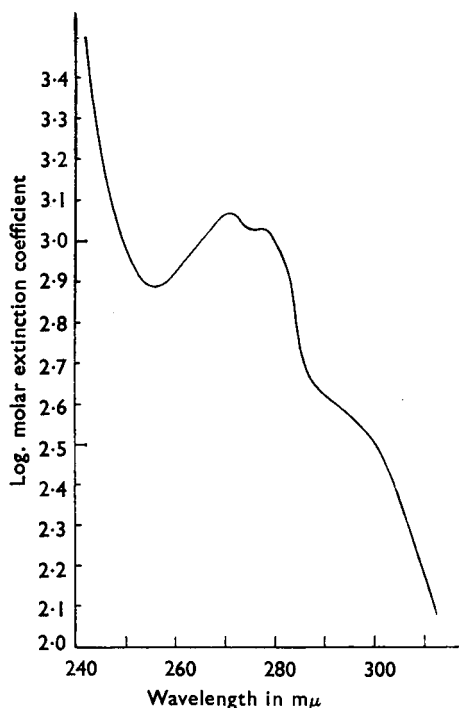


FIG. 1. Spectral absorption curve for benzocaine in 1 per cent. hydrochloric acid.

log. molar extinction coefficient of benzocaine in hydrochloric acid solution is 3.065.

A series of estimations were made upon a 5 per cent. ointment of benzocaine in soft paraffin and Table I shows the results obtained. The maximum deviation from the amount added was 1.5 per cent. and the mean 0.9 per cent. The table also shows the results obtained by the titrimetric method of the B.P.C. In this case the maximum error was 2.3 per cent. and the mean 1.5 per cent. It will be seen that the errors were mostly positive so that a trace of impurity in the ointment base might account for this.

A similar series using the compound ointment of the B.P.C. and the spectrophotometric method gave similar results. The only alteration in the method was as follows. The ointment equivalent to approximately 50 mg. of benzocaine was dissolved in 100 ml. of light petroleum and filtered to remove suspended zinc oxide. The filtrate was then extracted and determined as above. The resultant figures showed no appreciable

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interference from the other constituents of the ointment and are reproduced in Table II.

The speed and reproducibility of the spectrophotometric method warrant its use in preference to the titrimetric method especially where a number of samples have to be analysed.

SUMMARY

1. A method is described for the estimation of benzocaine in ointments by extraction of the drug and ultra-violet spectrophotometry.
2. In comparison with the method of the B.P.C. there is a considerable saving of time and slight improvement in accuracy.

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