CONFIDENTIAL

F.R. Note No. 33/1952

September, 1952.

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES' COMMITTEE
JOINT FIRE RESEARCH ORGANIZATION

A COMPARISON OF THE EFFECTS OF DIFFERENT GRADES OF CHLORO-BROMOMETHANE ON THE INFLAMMABILITY LIMITS OF n-HEXANE AND AIR

by

P. S. Tonkin

SUMMARY

The relative efficiencies of four samples of chlorobromomethane as inhibitors, using n-hexane as the combustible, have been determined. There were only small differences in the values obtained for the various samples; these differences were not considered of practical significance.

Introduction

In view of the different grades of chlorobromomethane produced for use in fire extinguishers it was considered desirable to compare the efficiencies of different samples. A series of experiments has been carried out for this purpose. Comparison with a sample previously tested (1) has also been made.

Experimental

Four samples of chlorobromomethane were tested; they were as follows:

(a) "Pure CB"

(b) "Impure CB"

(c) "CB"

(d) Chlorobromomethane distilled from an impure sample.

Samples (a) and (b) were obtained through the courtesy of the General Fire Appliance Company Limited, and were typical of the commercial grades available in this country.

"CB" was obtained from Germany after the war and was stated to have the following composition:

chlorobromomethane	70 per cent
dichlorobromomethane	12 per cent
dibromomethane	9 per cent
dichloromethane	9 per cent.

Sample (d) was chlorobromomethane with a boiling range 63°C - 75°C and was prepared by fractional distillation of the impure sample (c). This fraction was used for the experiments described previously (1).

The inflammability limits of n-hexane and air, to which the various qualities of chlorobromomethane had been added, were measured by the method of H. F. Coward and G. W. Jones (2) using the static system described elsewhere (3). A sufficient number of mixtures were tested to enable the peak values to be obtained for each sample.

The peak values obtained are given in Table I together with physical properties.

Table I

Peak values of n-hexane with different grades of chlorobromomethane

Sample	Boiling range	Specific gravity 17°C	Peak values % volume	
			n-hexane	Diluent
"Pure CB"	65°C - 68°C	1·937	2·5	6·25
"Impure CB"	60°C - 74°C	1·929	2·5	6·2
"CB"	45°C - 97°C	1·903	3·0	6·1
Chlorobromomethane	63°C - 75°C	1·947	2·45	6·35

Note: Pure chlorobromomethane has a boiling point 69°C and specific gravity $1{\cdot}991_{(19°C)}$ (4).

Conclusion

From the results shown in Table I it can be concluded that there is no difference of any practical significance in the fire extinguishing efficiences of the commercial grades of chlorobromomethane.

References

(1) F.C. Note No. 35/1950.
(2) H. F. Coward and G. W. Jones. U.S. Bur. Mines Bull. 279 (revised) 1938.
(3) F.R. Note No. 1.
(4) I. M. Heilbron and H. M. Bunbury. Dictionary of Organic Compounds, Vol. I 446. Eyre and Spottiswoode. London 1946.