was found to have a purity of 98.6 ± 0.2 mole per cent.[15]; its freezing point is 19.15 ± 0.06° and the f.p. calculated for zero impurity is 20.2 ± 0.3°.[16] Descamps[6] reported m.p. 20.1°.

Storage of the alcohol of 98.6 ± 0.2 mole per cent. purity in quartz without a drying agent (in a desiccator kept in the dark) for two months did not result in any change in the properties of this alcohol. In contrast, when a solution consisting of 4 ml. of the 98.6 ± 0.2 mole per cent. alcohol and 4 drops of distilled water (n^{20}D 1.5169) was placed in a brand new glass-stoppered Pyrex flask and the flask was stored in a desiccator kept on the desk-top out of direct sunlight, the solution soon underwent change. Thus after 15 days the n^{20}D had risen to 1.5193, the solution had become pale yellow, it had taken on a strong odor of acetophenone, and on treatment with 2,4-dinitrophenylhydrazine[13] it gave the 2,4-dinitrophenylhydrazone of acetophenone; m.p. and mixed m.p. 248–249° (uncor.). After 19 weeks n^{20}D had gone up to 1.5258 and the yellow color was much more pronounced.

Acknowledgment.—The authors are grateful to the Research Corporation for generous financial assistance.

(15) The method of F. D. Rossini, *et al.*, as modified by K. L. Nelson of this Department was employed. This will be published shortly. We are indebted to Mr. Nelson for his assistance in the determination and interpretation of the cooling curve data.

(16) The relevant data are to be found in the doctoral dissertation of S. A. Herbert, Jr., Purdue University, 1952.

DEPARTMENT OF CHEMISTRY
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RECEIVED JULY 30, 1951

Ultrasonic Velocity in a Series of Alkyl Acetates

BY R. T. LAGEMANN,[1] E. G. MCLEROY AND O. MILNER

Measurements of ultrasonic velocity are being made on various homologous series of organic compounds. These measurements generally show an increase of ultrasonic velocity with increase in molecular weight from the first member of the series onward. Certain series, however, show a definite minimum in the velocity, as has been shown recently for some ketones,[2] and some series would seem to show a decrease of velocity with increase in molecular weight. It has been thought in the past that the alkyl acetates belong to the last-named class. In a review article, Parthasarathy[3] says "the esters show a diminution in velocity with increasing length of the alcohol radical," and in support of his contention he presents a table taken from an earlier paper[4] giving data on five alkyl acetates.

Upon repeating the measurements on these five compounds and extending the series further at three temperatures, it is found that actually there is only a decrease as one goes from the first to the second member of the series, and that for the ethyl through heptyl members of the *n*-alkyl acetates there is a steady increase in the velocity. This may be seen in Table I. It may also be noted, in agreement with what has been found elsewhere[5] for certain other compounds, that the iso-isomer has a lower velocity than the corresponding normal one. Indeed, it was the inclusion by Parthasarathy of his results on the *i*-amyl acetate with those for four normal ones, which no doubt was in part responsible for the enunciation of the erroneous rule. For all the compounds investigated the temperature coefficient of velocity is nearly the same, as is commonly found.

TABLE I

ULTRASONIC VELOCITY IN A SERIES OF ALKYL ACETATES

Acetate	Velocity of sound, m./sec. 10°	20°	30°	Density, g./cc. at 30°	Adiabatic compressibility, dyne^{-1} cm.^{2} at 30° (× 10^{12})
Methyl	1228	1181	1136	0.9207	84.16
Ethyl	1209	1164	1119	.8886	89.87
n-Propyl	1232	1189	1146	.8777	86.75
n-Butyl	1256	1214	1170	.8707	83.90
n-Amyl	1280	1238	1197	.8685	80.36
n-Hexyl	1300	1258	1220	.8642	77.74
n-Heptyl	1319	1280	1241	.8618	75.34
Isopropyl	1178	1144	1100	.8616	95.92
Isobutyl	1219	1175	1134	.8600	90.42
Isoamyl	1258	1218	1179	.8645	83.21

Experimental

The compounds were Eastman Kodak Co. chemicals freshly fractionated in a Todd column of 30–50 theoretical plates before the ultrasonic velocity was measured. The velocity measurements were made on a variable-path ultrasonic interferometer[6] operated at 500 kc. per second and with the liquid under study kept at the stated temperature to within ± 0.03° with a constant temperature water-bath. The densities were measured with a 3-ml. double-arm pycnometer of the kind described by Lipkin and his co-workers.[7]

The three iso-alkyl acetates were obtained from Dr. W. Joe Frierson, to whom we are grateful. The work was also assisted by a Grant-in-Aid from the Research Corporation.

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RECEIVED AUGUST 10, 1951

N-Monosubstituted 2-Aminopyridines, 2-Aminopyrimidines and 2-Aminolepidines

BY IRVING ALLAN KAYE AND IRVING C. KOGON

In this investigation a number of N-monosubstituted 2-aminopyridines, 2-aminopyrimidines and 2-aminolepidines were prepared by two general methods as intermediates for the subsequent synthesis of compounds having possible chemotherapeutic application. Most of the pyridyl- and lepidylamines were obtained by heating a mixture of either 2-bromopyridine or 2-chlorolepidine and two or more equivalents of a primary amine at 170–180° for about 18 hours.[1] Yields were increased when a considerable excess of primary amine was employed. The remaining products were synthesized by alkylation of a heterocyclic amine with an alkyl halide in the presence of lithium amide.[1] Some reactions were conducted in the conventional two-step manner, *i.e.*, a lithium derivative of a heterocyclic amine was formed from

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