in comparing acetaldehyde and benzaldehyde, for example. The greatest difference in reactivity was between the allyl alcohol and the others investigated.

Summary

The equilibrium points in the reaction of β-amino-ethanol, β-phenylethanol, ethylene iodohydrin, β-ethoxy-ethanol, β-methoxy-ethanol, allyl alcohol, ethylene bromohydrin, ethylene chlorohydrin, ethyl hydracrylate and β-nitro-ethanol with acetaldehyde have been determined. Certain relationships have been pointed out as existing between the constitution of an alcohol and the affinity and reactivity that it manifests in acetal formation. Five acetals not hitherto prepared were obtained.

MADISON, WISCONSIN

[CONTRIBUTION FROM THE CHEMICAL LABORATORY OF CARTHAGE COLLEGE]

THE IDENTIFICATION OF ALKYL AND ARYL HALIDES

BY E. L. HILL

RECEIVED AUGUST 17, 1927 PUBLISHED JANUARY 5, 1928

A method for the identification of the primary alkyl bromides and iodides[1] was recently described. This method has now been applied

TABLE I

NEW ALKYL AND ARYL MERCURIC HALIDES

Mercuric bromide	M. p., °C. (corr.)	Formula	Analysis Calcd., %C	Analysis Found, %C
Sec.-Butyl[2]	39	....	...	...
Cyclohexyl[3]	153	....	...	...
Benzyl[4]	119	....	...	...
[a]Phenyl[5]	276	....	...	...
m-Tolyl[6]	184	....	...	...
n-Nonyl	109	$C_9H_{19}HgBr$	26.50	26.31
n-Lauryl	108	$C_{12}H_{25}HgBr$	32.029	31.90
*Iso*propyl	93.5	C_3H_7HgBr	11.18	11.13
β-Phenylethyl	169	$C_6H_5C_2H_4HgBr$	24.90	24.81
o-Tolyl	168	$CH_3C_6H_4HgBr$	22.64	22.59
[b]*p*-Tolyl	231[7]	$CH_3C_6H_4HgBr$	22.64	22.61

[a] This method is applicable to the corresponding iodide, m. p. 266°, first prepared by Dreher and Otto, *Ann.*, **154**, 109 (1870).

[b] The iodide containing this radical melts at 220° (*ibid.*, p. 173).

---

[1] Marvel, Gauerke and Hill, THIS JOURNAL, **47**, 3009 (1925).

[2] Marvel and Calvary, *ibid.*, **45**, 820 (1923).

[3] Grüttner, *Ber.*, **47**, 1651–1656 (1914).

[4] Wolff, *Ber.*, **46**, 66 (1913).

[5] Hilpert and Grüttner, *Ber.*, **46**, 1686 (1913); Dreher and Otto, *Ann.*, **154**, 111 (1870), recorded 291°.

[6] Michaelis, *Ber.*, **28**, 590 (1895).

[7] Pope and Gibson, *J. Chem. Soc.*, **101**, 736 (1912), found 228°.

successfully to certain secondary alkyl and aryl halides. It involves the preparation of the Grignard reagent and its treatment with the corresponding mercuric halide.

Experimental Part

Table I gives the melting points for several compounds of this class that are known, but which have not previously been identified by this method. It includes also the formulas and analytical data for new secondary alkyl and aryl mercuric halides prepared as indicated above.

Summary

The method already described for the identification of primary alkyl bromides and iodides may be applied with success to secondary alkyl and aryl bromides and iodides.

Carthage, Illinois

[Contribution from the Department of Chemistry, Iowa State College]

THE ELECTRON-SHARING ABILITY OF ORGANIC RADICALS—GLUCOSE AND OTHER POLY-ALCOHOLS

By James B. Allison with R. M. Hixon

Received August 20, 1927 Published January 5, 1928

A preceding paper[1] pointed out that the physical properties of the polar groupings RNH_2, RCOOH, RCH_2COOH, RCH_2CH_2COOH and ROH could be expressed as an exponential function of "the electron-sharing ability" of "R." A strict interpretation of these data implies that the electron-sharing ability of the carbon radicals varies from a range more "positive" than hydrogen to a range more "negative" than chlorine, according to the substituents of the carbon under consideration. When the composition of the radicals is considered in the order of their "negativity," it is found that the typical aromatic groupings are intermediate to the most "positive" and most "negative" of the aliphatic radicals. In other words, we may expect to find carbons in "aliphatic" compounds with properties as negative, or even more negative, than those in "aromatic" structures.

In a previous paper[2] attention was called to the negative nature of the third carbon atom in diacetoneglucose on the following evidence.

1. The chlorine in 3-chlorodiacetoneglucose is relatively stable toward alkaline hydrolysis.
2. When diacetoneglucosetoluenesulfonate ester is treated with Grignard's reagent, *p*-tolylphenylsulfone is obtained in analogy with the aromatic sulfonate esters rather than the aliphatic esters.[3]

---

[1] Hixon and Johns, This Journal, **49**, 1786 (1927).

[2] Allison and Hixon, *ibid.*, **48**, 406 (1926).

[3] Gilman, Robinson and Beaber, *ibid.*, **48**, 2715 (1926).