14.6225 grams of a mixture containing 7.6037 grams of acetic acid and 7.0188 grams of benzene were placed in the tube described above and a few centigrams of water were added successively, the mixture being exposed to the temperature of a mixture of ice and salt, *i. e.*, about —20°, after each addition of water. Not until 0.7226 gram of water had been added did there occur a separation into layers, which persisted even at 0°, but disappeared a few degrees above.

Now, Duclaux was fully aware that the presence of water rendered it possible to cause layer formation even at temperatures above 11°, for he writes: "It is indeed not necessary to have recourse to cold to obtain the separation, and the state of unstable equilibrium in which these liquids are, can be destroyed by the addition of a third substance, as, for example, water.

"A single drop of water suffices to cause a mixture of 10 cubic centimeters of benzene and of 10 cubic centimeters of acetic acid to become troubled.

"Acetic acid crystallizing at 14° always gives a limpid solution with benzene. If it crystallizes only at 12° the mixture of equal volumes remains troubled."

Now, acetic acid melting at 14° contains not inconsiderable quantities of water, so that the behavior just described by Duclaux is what is to be expected under the circumstances. If Duclaux had taken the trouble to raise the melting-point of his acid by a few fractional crystallizations, and had employed this purified acid, there would have been one less error and its rectification encumbering the pages of chemical journals.

SCHEME FOR THE IDENTIFICATION OF ACETANILIDE, PHENACETINE, QUININE SULPHATE, ETC.

BY F. S. HYDE.

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THE test made by boiling the substance with caustic potash and chloroform is one of the most important in the scheme given below. It is known as the "carbylamine reaction" or "isonitrile test," and is common to those compounds which are classed as *primary amines* ($R—NH_2$).

$$R - N\boxed{H_2 + Cl_3H}C + 3KOH = R - N \equiv C + 3KCl + 3H_2O.$$

SCHEME FOR THE IDENTIFICATION OF ACETANILIDE, PHENACETINE, QUININE SULPHATE, ETC.

Pure substance.	Melting-point. C.	Solubility in water.	Solution of substance in water.				
			Boiled with excess caustic potash and few drops chloroform.	Ferric chloride.	Dilute nitric acid.	Bromine water.
Acetanilide (Phenyl acetamide) $C_6H_5NH.COCH_6$.	113°	Soluble in cold; more so in hot.	Odor of isonitrile.	Yellow solution. Red on boiling.	Colorless.	White crystals. Para-brom-acetanilide.
Exalgine (Methyl Phenyl acetamide) $C_6H_5N.CH_3.COCH_3$.	101°	Not very soluble, cold; easily soluble, hot.	No odor of isonitrile. Class of secondary amines.	Yellow solution. Cloudy red on boiling.	Colorless.	No precipitate.
Phenacetine (Acetylparaamidophenetol) $C_6H_4.OC_2H_5.NH.COCH_3$.	135°	Soluble with difficulty.	Odor of isonitrile.	Yellow solution. Blood-red on boiling.	Cloudy yellow solution. Crystals of nitro compound.	No precipitate.
Phenecoll hydrochloride (Glycocollparaamidophenetol) $C_6H_4<\begin{matrix}OC_2H_5\\NH.COCH_2.NH_2.HCl.\end{matrix}$	No. M. P. HCl Comp.	Very soluble.	Odor of isonitrile.	Yellow solution. Darkens and orange precipitate on boiling.	Colorless.	No precipitate.
Salol (Phenol salicylate) $C_6H_4.OH.COO.C_6H_5$.	43°	Soluble with difficulty.	No odor of isonitrile. Yellow solution.	Yellow solution. Blood-red on boiling.	Colorless.	No precipitate cold; white cloudy compound on boiling.
Resorcin (Metadioxybenzene) $C_6H_4(OH)_2$,	118°	Easily soluble.	No odor of isonitile. Carmine-red solution.	Dark violet. Yellowish on adding drop of sulphuric acid.	Yellow solution.	Yellowish precipitate dissolving immediately.
Quinine sulphate $C_{20}H_{24}N_2O_2.H_2SO_4$.	....	Slightly soluble. With few drops of sulphuric acid dissolves with blue fluorescence.	Base precipitates and dissolves on heating.	Yellow solution.	Colorless with bluish fluorescence.	Dry substance on porcelain with weak bromine water gives green coloration on adding two or three drops ammonia water = Thallieoquin test.
Antipyrine (Phenyldimethylpyrazolon) $HOC_3N_2(CH_3)_2C_6H_5$.	113°	Soluble.	Nothing.	Blood-red. Disappears on adding a drop of sulphuric acid.	Colorless.	Yellowish-white precipitate.

Phenacetine.—Contrary to some writers, phenacetine *will* give the isonitrile test, and hence cannot be distinguished from acetanilide by this reaction.[1]

Exalgine does not respond to this test because it is a *secondary* amine; hence a distinction from acetanilide, phenacetine, and phenocoll.

The odor of raspberries attributed to exalgine, when heated, is somewhat misleading. It is certainly aromatic, but may resemble either strawberries or mulberries.

By boiling acetanilide with an alkaline solution of sodium hypobromite (NaBrO) or with alkaline permanganate, the same odor of isonitrile is produced, but the reaction is complicated and not perfectly understood. However, it is assumed that the benzene ring constituting the nucleus of the compound is partially broken down by the strong oxidizing action of the hypobromite or permanganate, and thus furnishes the necessary carbon substitution in the formation of isonitrile.

In making the carbylamine, isonitrile, or "isocyanide" test, as it may be called, it is preferable to have the solution strongly alkaline in every case to insure a more complete decomposition as well as quicker reaction and a more perceptible odor.

[CONTRIBUTIONS FROM THE CHEMICAL LABORATORY OF THE UNIVERSITY OF CALIFORNIA.]

ON THE PHYSICAL AND CHEMICAL PROPERTIES OF SOME CALIFORNIA OILS.

BY WALTER C. BLASDALE.

Received September 13, 1895.

THE investigations of which I would here record the results were undertaken some two years ago with three definite objects in view; first, the accurate determination of the limits of some of the standard constants of California olive oils; second, a practical test of the application of the Babcock method of determining adulterants in butter to a similar purpose for olive oil, and finally a determination of some of the constants of three new and hitherto undescribed oils of vegetable origin. In carrying out this work I have followed in general the methods laid down by Allen for the examination of oils, introducing such

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[1] *J. Anal. Appl. Chem.*, 7, 354.