

TABLE I  
PHYSICAL CONSTANTS AND ANALYTICAL DATA FOR TWENTY TERTIARY, ACETYLENIC AMINES

$$\begin{array}{c} \text{R} \diagup \\ \text{N} - \text{C} \equiv \text{C} - \text{R}' \\ \text{R} \diagdown \end{array} \quad \begin{array}{c} \text{H}_2 \\ | \\ \text{C}_4\text{H}_9 - \text{N} - \text{C} \equiv \text{C} - \text{R} \\ | \\ \text{C} \equiv \text{C} - \text{R} \\ \text{H}_2 \end{array}$$

Compound	Yield, %	B. p., °C. (cor.)		Mm.	$n_D^{25}$	$d_4^{25}$	$M R_D$		N, %	
							Calcd.	Found	Calcd.	Found
1-Dipropylaminopropyne-2	81	157.5-158.5	..°	10	1.4325	0.7986	45.70	45.26	10.06	10.09
1-Dipropylaminobutyne-2	81	70.0-70.5	10	10	1.4431	.8090	50.32	50.24	9.14	9.09
1-Dipropylaminopentyne-2	82.5	81.0-81.5	10	10	1.4423	.8040	54.94	55.09	8.37	8.42
1-Dipropylaminohexyne-2	75	94-95	10	10	1.4441	.8066	59.55	59.73	7.73	7.52
1-Dipropylaminoheptyne-2	76	108-109	10	10	1.4459	.8087	64.17	64.40	7.17	7.27
1-Dipropylaminoöctyne-2	77	120.5-121.5	10	10	1.4471	.8115	68.79	68.94	6.69	6.94
1-Diisopropylaminopropyne-2	81.5	152.5-153	..°	10	1.4385	.8017	45.70	45.64	10.06	10.19
1-Diisopropylaminobutyne-2	43	64-65	10	10	1.4482	.8209	50.32	49.97	9.14	9.03
1-Diisopropylaminopentyne-2	68	75.5-76	10	10	1.4470	.8146	54.94	54.94	8.37	8.38
1-Diisopropylaminohexyne-2	62	89-90	10	10	1.4490	.8182	59.55	59.44	7.73	7.75
1-Diisopropylaminoheptyne-2	62	103	10	10	1.4505	.8200	64.17	64.09	7.17	7.27
1-Diisopropylaminoöctyne-2	66	115.5-116.5	10	10	1.4515	.8203	68.79	68.79	6.69	6.71
1-Dibutylaminopropyne-2	89	77.5-78.5	10	10	1.4381	.8045	54.93	54.59	8.37	8.13
1-Dibutylaminobutyne-2	75	97.5-97.8	10	10	1.4465	.8139	59.55	59.46	7.73	7.73
1-Dibutylaminopentyne-2	76	107-107.2	10	10	1.4455	.8090	64.17	64.33	7.17	6.92
1-Dibutylaminohexyne-2	72	119.5-119.8	10	10	1.4472	.8813	68.79	68.98	6.69	6.65
1-Dibutylaminoheptyne-2	75.5	131.6-132.2	10	10	1.4483	.8127	73.41	73.63	6.27	6.26
1-Dibutylaminoöctyne-2	77	143.5-143.8	10	10	1.4498	.8144	78.03	78.32	5.90	5.84
N-n-Butyl-di-2-propynylamine	76.5	73-74	10	10	1.4567	.8512	48.31	47.71	9.39	9.36
N-n-Butyl-di-2-butyrylamine	72	114.5-115.5	10	10	1.4778	.8616	57.56	58.20	7.90	7.80

\* Boiling point at normal atmospheric pressure is given.

this method was described. Various alkyl halides were then coupled with the sodium acetylide of 1-diethylamino-propyne-2 to form a series of 1-diethylamino-2-alkynes. These reactions have been applied in the synthesis of three additional series of tertiary, monoacetylenic amines and in the synthesis of two tertiary, diacetylenic amines.

The physical constants and analytical data for the compounds prepared are summarized in Table I.

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#### A New Complex of Acetylsulfanilamide, Ethylenediamine and Copper

Complexes of several sulfa compounds with ethylenediamine and various metals have been reported.<sup>1,2,3,4,5</sup> Bacteriostatically inactive N<sup>1</sup>-acetylsulfanilamide was chosen for the present investigation so that the bactericidal and fungicidal properties of its complex with ethylenediamine and copper could be studied; these studies will be reported at a later date.

- (1) J. Erdos, *Ciencia (Mex.)*, **8**, 265 (1948).
- (2) J. Erdos, *Anales escuela nacl. cienc. biol. (Mex.)*, **5**, 105 (1948).
- (3) J. Erdos and R. Ramirez, in press.
- (4) J. Erdos and L. Ortiz, in press.
- (5) J. Erdos and M. Bernea, in press.

The complex was prepared by adding 0.25 mole of finely powdered N<sup>1</sup>-acetyl-sulfanilamide to a stirred solution of 0.10 mole of freshly prepared moist cupric hydroxide in 0.50 mole of ethylenediamine monohydrate. The resulting solution, filtered through glass wool, was poured into 2-3 times its volume of ethanol. After twenty-four hours the solid product was filtered by suction, washed with absolute ethanol and dried in a vacuum desiccator over sulfuric acid. The blue crystalline complex has a density of 1.4577 at 15° and melts at 190°. It is insoluble in ether, acetone, chloroform, benzene, cold ethanol and cold carbon bisulfide (gives copper sulfide when warmed with carbon bisulfide) but is soluble in ethylene glycol, propylene glycol, glycerol and hot ethanol. The complex is insoluble in cold 10% acetic acid but soluble in hot 10% acetic acid, water, 4% sodium hydroxide, 4% hydrochloric acid, glacial acetic acid, concd. hydrochloric acid, concd. sulfuric acid and 30% sodium hydroxide. Only the solutions in the more concentrated acids give the reactions of the cupric ion.

The analytical data indicate a complex containing N<sup>1</sup>-acetylsulfanilamide, ethylenediamine and copper in the ratio 2:2:1.

*Anal.* Calcd.: N, 18.3; S, 10.5; Cu, 10.4. Found: N, 17.7; S, 10.9; Cu, 10.4.

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