TABLE I
AMIDES
$RCON(CH_2CH_2Cl)_2$

R	B.p. (mm.), °C.	Form	Yield, %	Formula	C, % Calcd.	C, % Found	H, % Calcd.	H, % Found
C_2H_5	124–126 (3)	Oil	65	$C_7H_{13}Cl_2NO$	42.4	42.1	6.57	6.61
C_3H_7	136–138 (3)	Oil	60	$C_8H_{15}Cl_2NO$	45.2	44.6	7.07	7.10
C_4H_9	147–146 (3)	Oil	58	$C_9H_{17}Cl_2NO$	47.8	47.3	7.52	7.55
C_5H_{11}	M.p. 60–62	Wax	58	$C_{10}H_{19}Cl_2NO$	49.9	49.6	7.91	7.93

Table II
BIOLOGICAL RESULTS

Drugs	Dose/day, mg./kg.	Days	LD_{50}, mg./kg.	Ascitic carcinoma	Sarcoma 180
$C_5H_{11}CON(CH_2CH_2Cl)_2$	100	6	...	Only reduction of ascitic fluid	No effect
$CH_3SO_2N(CH_2CH_2OSO_2CH_3)_2$	5	6	300	No effect	Some inhibition, life extension 10 days
$CH_3SO_2N(CH_2CH_2I)_2$	100	8	2700[a]	Some inhibition, life extension 7 days	Inhibition, life extension 25 days

[a] By oral administration.

was added slowly to a stirred solution of N,N-bis(2-hydroxyethyl)-propionamide (0.06 mole) and pyridine (30 ml.) in chloroform (30 ml.) in an ice bath. After 2 hr., addition of 200 ml. of 1 *N* HCl gave 2.4 g. (12%) of N,N-bis(mesylethyl)methanesulfonamide as a crystalline solid, m.p. 112–114°. A mixture melting point with N,N-bis(mesylethyl)methanesulfonamide synthesized from diethanolamine gave no depression.

N,N-Bis(2-mesylethyl)methanesulfonamide.—Methanesulfonyl chloride (0.45 mole) in chloroform (10 ml.) was added slowly to a stirred solution of diethanolamine (0.20 mole), pyridine (70 ml.), and chloroform (40 ml.) in an ice bath. Stirring was continued for 2 hr. and the product was crystallized by addition of 200 ml. of 1 *N* HCl and recrystallized from water; yield 25%; white needles, m.p. 112–114°. The infrared spectrum showed maxima at the following fequencies: 3000, 2980, 1450, 1340, 1260, 1180, 1150, 1120, 1020, 1000, 975, 950, 930, 900, 807, 775, 735, and 725 cm.$^{-1}$.

Anal. Calcd. for $C_7H_{17}NO_8S_3$,: N 4.13; S, 28.39. Found: N, 3.98; S, 28.05.

N,N-Bis(2-iodethyl)methanesulfonamide.—Sodium iodide (0.02 mole) was added to a solution of N,N-bis(2-mesylethyl)-methanesulfonamide (0.008 mole) in acetone (60 ml.) and stirred at 37° for 45 hr. The solid was removed by filtration, half of the acetone was evaporated, and the crude product crystallized by adding water. Recrystallization from petroleum ether (b.p. 70–80°) gave white needles, m.p. 96–98°, yield 66%. The infrared spectrum showed maxima at the following frequencies: 3000, 2980, 1450, 1340, 1230, 1180, 1150, 1110, 1050, 1020, 970, 930, 800, 780, 735, and 715 cm.$^{-1}$.

Anal. Calcd. for $C_5H_{11}I_2NO_2S$: I, 62.90; N, 3.47. Found: I, 62.73; N, 3.50.

Acknowledgment.—The author thanks Dra. Rosa W. Levín of the Instituto Municipal de Radiología y Fisioterapia for permission to use their previously unpublished biological results.

New Compounds

Agents Affecting Lipid Metabolism. XVI. The Synthesis of Analogs of *trans*-1,4-Bis(2-chlorobenzylaminomethyl)cyclohexane[1]

LESLIE G. HUMBER

Ayerst Research Laboratories, Montreal, Canada

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Previous reports from this laboratory[2] have described the effects of *trans*-1,4-bis(2-chlorobenzylaminomethyl)cyclohexane on various aspects of lipid metabolism. The synthesis of this compound and of a series of related compounds containing the cyclohexane-1,4-bis(methylamine) moiety has recently been described.[3] In this communication, the synthesis of a series of related compounds is reported, wherein the cyclohexane-1,4-bis(methylamine) moiety is replaced by others of different electron density, bulk, shape, and inter-nitrogen distance. They are shown in Table I and some of the intermediates used in their preparation are in Table II.

Experimental

Melting points were taken on a Thomas–Hoover apparatus and are corrected. Analyses were done by Mr. W. Turnbull and Staff of our laboratories. The compounds described in Table I were prepared, as indicated, by methods A or B.[3] Some of the required starting materials were obtained from commercial sources and others by published procedures, *viz.*, *trans*-2,5-bis-(aminomethyl)-1,4-dioxane,[4] *trans*-1,4-bis(2-aminoethyl)cyclohexane,[5] 2,5-*bis*(aminomethyl)spiro[3.3]heptane,[6] *d-cis*-1,3-bis-(aminomethyl)camphocean,[7] *trans*-cyclohexane-1,4-diacetic acid,[5]

(1) For Part XV of this series see M. L. Givner and D. Dvornik, *Biochem. Pharmacol.*, in press.

(2) (a) C. Chappel, J. Dubuc, D. Dvornik, M. Givner, L. Humber, M. Kraml, K. Voith, and R. Gaudry, *Nature*, **201**, 497 (1964); (b) M. Kraml, J. F. Bagli, and D. Dvornik, *Biochem. Biophys. Res. Commun.*, **15**, 455 (1964); (c) M. L. Givner, M. Kraml, D. Dvornik, and R. Gaudry, *Nature*, **203**, 317 (1964).

(3) L. G. Humber, *J. Med. Chem.*, **7**, 826 (1964). The code number of the parent compound is AY-9944.

(4) R. K. Summerbell and J. R. Stephens, *J. Am. Chem. Soc.*, **76**, 6401 (1954).

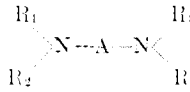
(5) P. P. Garcia and J. H. Wood, *J. Org. Chem.*, **26**, 4167 (1961).

(6) L. M. Rice and C. H. Grogan, *ibid.*, **26**, 54 (1961).

(7) J. Bredt and M. de Souza, *J. prakt. Chem.*, **133**, 84 (1932).

TABLE I

N,N'-DISUBSTITUTED DIAMINES



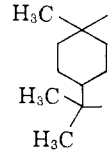
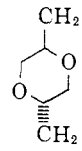
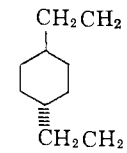
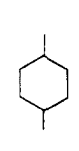
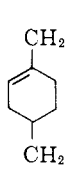
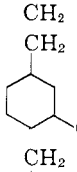
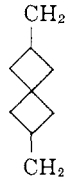
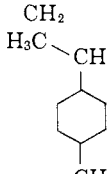
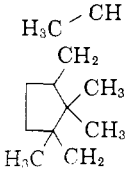
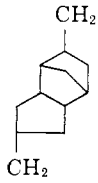
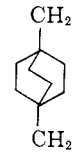
No.	A	R_6 N< R_7	M.p., °C.	Recryst. solvent	Route	Formula	% Cl Calcd.	% Cl Found	% N Calcd.	% N Found
1	$(CH_2)_2$		293–294	*a, b*	A	$C_{16}H_{18}Cl_2N_2 \cdot 2HCl$	37.11	36.96	7.33	7.23
2	$(CH_2)_3$		225–226	*a, b*	A	$C_{17}H_{20}Cl_2N_2 \cdot 2HCl$	35.79	35.17	7.07	6.82
3	$(CH_2)_4$		284–285	*a, b*	A	$C_{18}H_{22}Cl_2N_2 \cdot 2HCl$	34.57	34.43	6.83	6.90
4	$(CH_2)_5$		235–237	*a, b*	A	$C_{19}H_{24}Cl_2N_2 \cdot 2HCl$	33.43	33.20	6.61	6.38
5	$(CH_2)_6$		261–262	*e*	A	$C_{20}H_{26}Cl_2N_2 \cdot 2HCl$	32.36	31.96	6.39	6.17
6	$(CH_2)_7$		195–197	*a*	A	$C_{21}H_{28}Cl_2N_2 \cdot 2HCl$	31.36	30.57	6.19	6.10
7	$(CH_2)_8$	$NHCH_2$-2-ClC_6H_4	205–207	*a, b*	A	$C_{22}H_{30}Cl_2N_2 \cdot 2HCl$	30.40	30.14	6.01	6.02
8	$(CH_2)_9$		191–193	*b, c*	A	$C_{23}H_{32}Cl_2N_2 \cdot 2HCl$	29.53	29.43	5.84	5.85
9	$(CH_2)_{10}$		194–195	*a, b*	A	$C_{24}H_{34}Cl_2N_2 \cdot 2HCl$	28.69	28.44	5.67	6.02
10	$(CH_2)_{11}$		209–211	*a, b*	A	$C_{25}H_{36}Cl_2N_2 \cdot 2HCl$	27.90	27.49	...	...
11		$NHCH_2C_6H_5$	221–222	*a, b*	A	$C_{21}H_{34}N_2 \cdot 2C_4H_4O_4$[d]	...	...	4.81	4.72
12		$NHCH_2$-2-ClC_6H_4	262–263	*a, b*	A	$C_{21}H_{32}Cl_2N_2 \cdot 2HCl \cdot 0.5H_2O$[e]	28.28	28.02	5.58	5.14
13		$NHCH_2$-2-ClC_6H_4	265–267	*a, f*	A	$C_{20}H_{24}Cl_2N_2O_2 \cdot 2HCl$	30.28	30.01	5.98	5.77
14		NHC_6H_{11}[g]	189–191	*b, c*	B	$C_{22}H_{42}N_2 \cdot 2CH_3COOH$[h]	...	...	...	...
15		$NHCH_2$-2-ClC_6H_4	304–305	*a, i*	A	$C_{21}H_{32}Cl_2N_2 \cdot 2HCl$	28.81	28.89	5.69	5.56
16		NHC_6H_{11}[g,j]	177–178	*b, c*	A	$C_{18}H_{30}N_2 \cdot 2CH_3COOH$[k]	...	...	...	...
17		$NHCH_2C_6H_{11}$[g,j]	216–219	*a, l*	A	$C_{20}H_{38}N_2 \cdot 2CH_3COOH$[m]	...	...	6.57	6.82
18		$NHCH_2CH_2C_6H_{11}$[g,j]	210–213	*a, l*	A	$C_{22}H_{42}N_2 \cdot 2CH_3COOH$[n]	...	...	6.16	6.37
19		$NH(CH_2)_2$-2-ClC_6H_4[o]	177–178	*e*	A	$C_{22}H_{28}Cl_2N_2 \cdot 2CH_3COOH$	13.86	13.87	...	...
20		$NHCH_2$-2-ClC_6H_4[p]	279–281	*a, b*	A	$C_{20}H_{24}Cl_2N_2 \cdot 2HCl$	32.51	32.91	6.42	6.78
21		$NHCH_2$-2-ClC_6H_4[p]	148–155	*q, r*	A	$C_{20}H_{24}Cl_2N_2 \cdot 2CH_3COOH$	14.67	14.34	5.79	5.75
22		NHC_6H_{10}[q]	195–198	*a, l*	B	$C_{20}H_{36}N_2 \cdot 2CH_3COOH$[s]	...	...	6.60	6.66
23		$NHCH_2C_6H_{11}$[q]	192–195	*a, l*	B	$C_{22}H_{40}N_2 \cdot 2CH_3COOH$[t]	...	...	6.19	6.17
24		$NHCH_2CH_2C_6H_{11}$[q]	176–181	*a, l*	B	$C_{24}H_{44}N_2 \cdot 2CH_3COOH$[u]	...	...	5.83	6.05
25		$NHCH_2$-2-ClC_6H_4	274	*a, b*	A	$C_{22}H_{26}Cl_2N_2 \cdot 2HCl$	30.67	30.13	6.06	5.93
26		NH-(*dl*-1-indanyl)	>300	*a*	B	$C_{20}H_{32}N_2 \cdot 2HCl$	15.92	15.97	6.29	6.25
27		$NHCH_2C_6H_5$[j]	179–180	*g*	A	$C_{22}H_{30}N_2 \cdot 2HCl$	17.93	17.56	7.08	7.14
28		$NHCH_2$-2-ClC_6H_4	160–162	*b, c*	A	$C_{22}H_{28}Cl_2N_2 \cdot 2C_4H_4O_4$[d]	11.37	11.20	4.49	4.14
29		$NHCH_2$-2-ClC_6H_4	224–230	*a, b*	A	$C_{23}H_{28}Cl_2N_2 \cdot 2HCl$	29.77	29.20	5.58	5.86
30		$NHCH_2$-2-ClC_6H_4	308–310	*a*	A	$C_{21}H_{32}Cl_2N_2 \cdot 2HCl$	28.81	28.63	5.69	5.79
31		$NHCH_2$-2-ClC_6H_4	309–310	*a, b*	A	$C_{21}H_{32}Cl_2N_2 \cdot 2HCl$	28.81	28.63	5.69	5.85

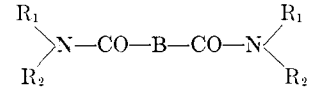
TABLE I (*Continued*)

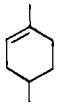
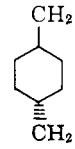
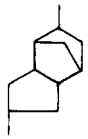
No.	A	$N<^{R_1}_{R_2}$	M.p., °C.	Recrystn. solvent	Route	Formula	% Cl Calcd.	% Cl Found	% N Calcd.	% N Found
32		NHC_6H_{11}[a]	>300	*a, b*	B	$C_{24}H_{42}N_2 \cdot 2HCl$	16.43	16.48	6.50	6.55
33		$C_9H_{10}N$[v]	114–119	*q*	B	$C_{22}H_{36}N_2$[w]	...	...	6.99	7.09

[a] Methanol. [b] Ether. [c] Ethanol. [d] A diacid maleate salt. [e] *Anal.* Calcd.: H_2O, 1.79. Found: H_2O, 1.50. [f] Ethyl acetate. [g] C_6H_{11} ≡ cyclohexyl. [h] *Anal.* Calcd.: C, 68.68; H, 11.08. Found: C, 68.31; H, 11.14. [i] Water. [j] A mixture of *cis* and *trans* isomers. [k] *Anal.* Calcd.: C, 66.30; H, 10.62. Found: C, 66.06; H, 10.69. [l] Acetonitrile. [m] *Anal.* Calcd.: C, 67.56; H, 10.87. Found: C, 67.54; H, 10.79. [n] *Anal.* Calcd.: C, 68.68; H, 11.08. Found: C, 68.50; H, 10.98. [o] A *cis* 1,4-isomer. [p] A *trans* 1,4-isomer. [q] Acetone. [r] Hexane. [s] *Anal.* Calcd.: C, 67.88; H, 10.44. Found: C, 67.83; H, 10.46. [t] *Anal.* Calcd.: C, 68.98; H, 10.69. Found: C, 68.55; H, 10.73. [u] *Anal.* Calcd.: C, 69.95; H, 10.90. Found: C, 69.15; H, 10.99. [v] $C_9H_{10}N$ ≡ 1,2,3,4-tetrahydroisoquinolino. [w] *Anal.* Calcd.: C, 83.94; H, 9.06. Found: C, 84.20; H, 8.95.

TABLE II

N,N'-DISUBSTITUTED DIAMIDES



No.	B	$N<^{R_1}_{R_2}$	M.p., °C.	Recrystn. solvent	Formula	% C Calcd.	% C Found	% H Calcd.	% H Found	% N Calcd.	% N Found
34		$NHCH_2C_6H_{11}$[a]	228–232	*b*	$C_{22}H_{36}N_2O_2$	73.30	72.98	10.07	9.85	7.77	7.96
35		NHC_6H_{11}[a]	302–306	*b*	$C_{20}H_{32}N_2O_2$	72.03	72.19	9.97	9.82	8.40	8.46
36		$NHCH_2CH_2C_6H_{11}$[a]	219–226	*b*	$C_{24}H_{40}N_2O_2$	74.18	74.47	10.38	10.52	7.21	7.34
37		NH-(*dl*-1-indanyl)	>300	*c*	$C_{26}H_{28}N_2O_2$	77.97	77.13	7.05	7.32	7.00	6.95
38		NHC_6H_{11}[a]	310–312	*c*	$C_{22}H_{38}N_2O_2$	72.88	72.97	10.56	10.48	7.73	7.53
39		NHC_6H_{11}[a]	224–227	*d*	$C_{24}H_{38}N_2O_2$	74.56	74.54	9.91	9.80	7.25	6.91
40		$C_9H_{10}N$[e]	209–214	*b*	$C_{28}H_{32}N_2O_2$	78.47	78.34	7.53	7.37	6.54	6.56

[a] C_6H_{11} ≡ cyclohexyl. [b] Methanol. [c] Dimethylformamide. [d] Sublimed at 205° (0.07 mm.). [e] $C_9H_{10}N$ ≡ 1,2,3,4-tetrahydroisoquinolino.

bicyclo[2.2.2]octane-1,4-dicarboxylic acid,[8] and 1-cyclohexene-1,4-dicarboxylic acid.[9] The syntheses of those intermediates which are new are described below.

1,4-Diacetylcyclohexane.—To a solution of *cis-trans*-cyclohexane-1,4-dicarbonitrile (13.4 g., 0.1 mole) in benzene, was added over 20 min. in a nitrogen atmosphere a solution of methylmagnesium bromide (13.3 ml. of a 3 *M* solution, 0.4 mole) in ether. After refluxing the mixture for 4 hr., it was poured onto a mixture of cracked ice and 150 ml. of concentrated HCl. The organic layer was separated and taken to dryness to yield 3.1 g. of the starting dinitrile. The aqueous acidic solution of the ketimine was hydrolyzed to the diketone by refluxing for 60 min. Extraction with benzene followed by washing, drying, and evaporation yielded the title compound as a liquid (12.2 g.). Crystallization from petroleum ether (b.p. 80–100°) yielded material of m.p. 57–58.5°.

Anal. Calcd. for $C_{10}H_{16}O_2$: C, 71.39; H, 9.59. Found: C, 71.37; H, 9.48.

1-Cyclohexene-1,4-dicarboxamide.—1-Cyclohexene-1,4-dicarbonyl chloride [b.p. 140° (0.06 mm.)], prepared from the corresponding diacid[9] (71 g.), was added slowly to concentrated aqueous NH_4OH (200 ml.) at 0°. The title compound was isolated in the usual manner (91%). A sample crystallized from dimethylformamide had m.p. >310°.

Anal. Calcd. for $C_8H_{12}N_2O_2$: N, 16.66. Found: N, 16.61.

1-Cyclohexene-1,4-bis(methylamine).—This compound was obtained in 25% yield from the above diamide by reduction with lithium aluminum hydride in tetrahydrofuran in the usual manner. It was an oil, b.p. 76–78° (0.1 mm.); dihydrobromide, m.p. >300°.

Anal. Calcd. for: $C_8H_{18}Br_2N_2$: Br, 52.9; N, 9.28. Found: Br, 52.7; N, 9.29.

(8) P. C. Guha, *Ber.*, **72**, 1359 (1939).

(9) W. J. Bailey and R. Barclay, Jr., *J. Am. Chem. Soc.*, **81**, 5393 (1959).

Cyclohexane-1,3-bis(methylamine).—*m*-Xylylenediamine (13.6 g.) was hydrogenated in ethanol solution with ruthenium dioxide catalyst (272 mg.) at 200° and a pressure of 105.45 kg./cm.^{2} (1500 p.s.i.). The theoretical amount of hydrogen was taken up in 12 hr. Removal of the catalyst by filtration and fractional distillation of the filtrate yielded an oil (11.4 gm.), b.p. 120° (15 mm.). A dihydrochloride salt was prepared with ethereal HCl. It was crystallized from ethanol–ether and had m.p. 252–254°.

Anal. Calcd. for $C_8H_{20}Cl_2N_2$: Cl, 32.95; N, 13.02. Found: Cl, 32.16; N, 12.91.

Dimethyl Cyclohexane-*trans*-1,4-dicarbamate.—Sodium methoxide (from 2.7 g. of sodium) in methanol (60 ml.) was added slowly to a refluxing mixture of cyclohexane-*trans*-1,4-dicarboxamide[10] (5.0 g., 0.294 mole) in methanol (400 ml.), followed by bromine (4.7 g.). The additions of sodium methoxide and bromine were repeated three times using the same quantities as above. After refluxing for 4 hr., the solution was filtered, and the filtrate was concentrated to dryness and triturated with water. Filtration yielded the crude dicarbamate. It was crystallized from acetone to yield pure material (5.8 g., 85.8%), m.p. 259–260°. This compound has previously been prepared from *trans*-cyclohexane-1,4-diamine and methylchloro carbonate and reported to have m.p. 264°.[11]

Dimethyl cyclohexane-*cis*-1,4-dicarbamate was prepared as described above from cyclohexane-*cis*-1,4-dicarboxamide[10] in 60% yield, m.p. 138–140° (ether–hexane), lit.[11] m.p. 139–140°.

Cyclohexane-*trans*-1,4-diamine.—Dimethyl cyclohexane-*trans*-1,4-dicarbamate (1.3 g.) was refluxed for 6 hr. with 50 ml. of concentrated HCl. Removal of the acid *in vacuo* and trituration of the residue with acetone yielded the dihydrochloride (1.0 g., 94.5%). A sample crystallized from methanol had m.p. >300.[5]

Anal. Calcd. for: $C_6H_{16}Cl_2N_2$: Cl, 37.89; N, 14.98. Found: Cl, 37.87; N, 14.94.

The free base was obtained from the salt in the usual manner. It is very volatile and water soluble. It had m.p. 69–71°, lit. m.p.[12] 72–73° (obtained in *ca.* 12% yield by the action of sodium azide on the corresponding diacid).

Cyclohexane-*cis*-1,4-diamine.—The dihydrochloride salt of the title compound was obtained from the corresponding dicarbamate as described above, in 61% yield, m.p. >310° (MeOH–ether).

Anal. Calcd. for $C_6H_{16}Cl_2N_2$: Cl, 37.89; N, 14.98. Found: Cl, 37.68; N, 14.68.

This free base, an oil, was not characterized, but was used crude.

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A Convenient Synthesis of 5-Hydroxy-2-methyltryptophan

FREDERICK LEONARD[1] AND WALTER TSCHANNEN

Department of Medicinal Chemistry, Geigy Research Laboratories, Ardsley, New York

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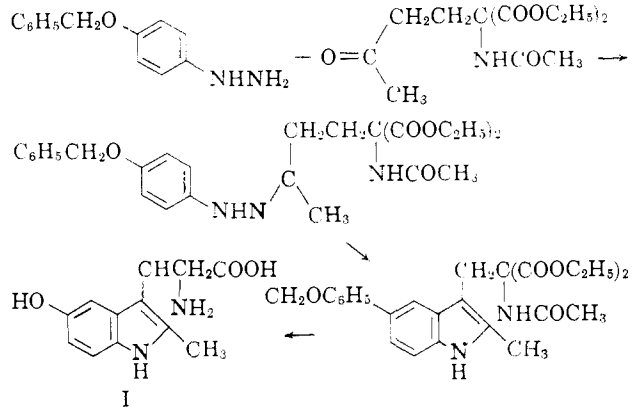
Pentamalli,[2] in a recent article on the synthesis of potential antagonists of serotonin (5-hydroxytryptamine),[3] described the preparation from gramine intermediates of 5-hydroxy-2-methyltryptophan (I), a compound which we synthesized several years ago by an adaptation of the Warner–Moe tryptophan synthesis.[4] It should be noted, on the other hand, that all attempts to prepare 2-methyl-5-methoxytryptophan[5] by a Warner–Moe synthesis failed at the first step, *i.e.*, hydrazone formation, and it became necessary to prepare it from a gramine intermediate.[6]



Experimental[7]

Diethyl Acetamido(5-benzyloxy-2-methyl-3-indolylmethyl)-malonate.—Methyl vinyl ketone (13.5 ml., 0.166 mole) was added dropwise during 20 min. to a cooled (−10 to +3°), efficiently stirred slurry of 29.0 g. (0.134 mole) of diethyl acetamidomalonate, 0.15 g. of sodium methoxide, and 75 ml. of absolute ethanol. The mixture was stirred for 2 hr. at −10 to +3°, treated with 29.0 g. (0.135 mole) of *p*-benzyloxyphenylhydrazine[8] and 3.7 ml. of glacial acetic acid, heated at 50–55° in an atmosphere of nitrogen, and stored at room temperature overnight. The mixture was diluted to 500 ml. with water, treated with 20 ml. of H_2SO_4 with vigorous stirring, and refluxed for 3 hr.[9] The reaction mixture was cooled in an ice bath, and stored overnight in the refrigerator. The precipitate (m.p. 185° dec.) was filtered off, washed with water, and dried *in vacuo;* yield 49.6 g. (79.6%), m.p. 199–200° after recrystallization from isopropyl alcohol.

Anal. Calcd. for $C_{26}H_{30}N_2O_6$: C, 66.92; H, 6.48; N, 6.01. Found: C, 66.66; H, 6.87; N, 5.90.

DL-5-Benzyloxy-2-methyltryptophan.—A mixture of 40.0 g. (0.0857 mole) of diethyl acetamido(5-benzyloxy-2-methyl-3-indolylmethyl)malonate and 400 ml. of 10% NaOH solution was refluxed for 10 hr., filtered hot, cooled, acidified to pH 3 with 6 *N* HCl, and stored overnight in the refrigerator. The precipitate of acetamido(5-benzyloxy-2-methyl-3-indolylmethyl)malonic acid was removed by filtration, washed with water, and dried *in vacuo;* yield 35.0 g. (99%), m.p. 148–149°. After reprecipitation from 0.1 *N* $NaHCO_3$ solution with 0.1 *N* HCl and washing with water, the preparation melted at 150–151°.

Anal. Calcd. for $C_{22}H_{22}N_2O_6$: N, 6.77. Found: N, 6.62.

The malonic acid (30.0 g., 0.0732 mole) was refluxed with stirring for 24 hr. with 200 ml. of water, diluted with 100 ml. of 10% NaOH, refluxed for an additional 24 hr., filtered hot, cooled, and acidified with acetic acid. The voluminous precipitate was filtered off, washed with water, and dried; yield 16.7 g. (70.4%), m.p. 248–250° dec. It melted at 257–259° after recrystallization from 50% ethanol.

Anal. Calcd. for $C_{19}H_{20}N_2O_3$: C, 70.33; H, 6.22; N, 8.64. Found: C, 70.06; H, 6.20; N, 8.10.

(1) Psychopharmacology Service Center, National Institute of Mental Health, Bethesda, Md. 20014.

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