SYNTHESIS OF ARYL-2-INDOLYLCARBINOL

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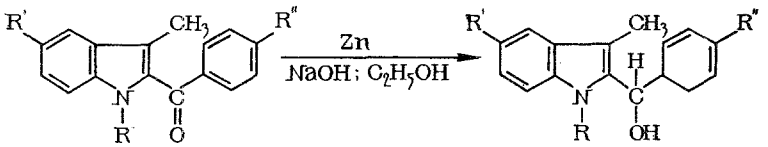
Among the diarylcarbinol derivatives are found compounds showing a wide spectrum of biological activity. Even benzhydrol itself is bacteriostatic [1], fungistatic, and sporostatic, and shows anti-histamine activity [2]. According to the patent literature [3] alkylaryl-2-indolylcarbinols, obtained by the interaction of 2-aroylindole with alkyl dialkyl aminomagnesium halide, are strong sedatives. It therefore seems well worthwhile to investigate the biological properties of the aryl-2-indolylcarbinols—the structural analogs of the diarylcarbinols and of the alkylaryl-2-indolylcarbinols in the directions indicated.

The derivatives of aryl-2-indolylcarbinol, which until now have been comparatively little investigated [4], have been prepared in the present investigation in high yield of reduction of the 2-aroylindoles [3, 5, 6] with zinc, in an alcoholic solution of alkali.



The stability of the aryl-2-indolylcarbinols is determined by the presence or absence of the group attached to the nitrogen atom of the indole ring. The aryl-2-indolylcarbinols which are not substituted at the nitrogen atom are unstable; they darken in the light, they are hygroscopic, whereas the aryl-2-(1-methylindolyl) carbinols are quite stable.

These aryl-2-indolylcarbinols show a distinctive infrared spectrum, from which the absorption bands in the region of 1610-1620 cm^{-1} are absent; this property is shown in the parent compounds and is related to valency oscillations of the C=O group. The strong band in the region 3490-3510 cm^{-1} corresponds to valency oscillations of the hydroxyl group. In the ultraviolet spectra of the aryl-2-indolylcarbinols, two absorption maxima are observed, one at 230 nm (log ε=4.54), and 285 nm (log ε=4.00).

EXPERIMENTAL

Derivatives of Aryl-2-(3-Methylindolyl) Carbinol (Compounds I–VI). To a hot solution of 0.1 mole of 2-aroyl-3-methylindole in 500 ml of ethyl alcohol were added 100 g of zinc dust and 80 g of caustic soda. The mixture was heated on a water bath and stirred vigorously for 10 hours. Then, without cooling the solution was separated from the sediment, and poured into a mixture of ice and water. The precipitate of

TABLE 1

Compound	R	R'	R"	Yield, %	Melting point (°C); crystallized from ether-petroleum ether	Found, %			Empirical formula	Calculated, %		
						C	H	N		C	H	N
I	H	H	CH_3	94	131–131,5	81,01	6,81	5,50	$C_{17}H_{17}NO$	81,24	6,81	5,57
II	H	CH_3	H	98,5	146–7	81,16	6,81	5,53	$C_{17}H_{17}NO$	81,24	6,81	5,57
III	CH_3	CH_3	H	93,2	87–87,5	81,45	7,37	5,48	$C_{18}H_{19}NO$	81,47	7,21	5,28
IV	H	CH_3	CH_3	94,3	118–9	81,20	7,14	5,26	$C_{18}H_{19}NO$	81,47	7,21	5,28
V	H	CH_3	OCH_3	93,8	121–2	76,90	7,14	4,90	$C_{18}H_{19}NO_2$	76,83	6,80	4,97
VI	H	OCH_3	CH_3	90	130–1	77,01	6,90	4,85	$C_{18}H_{19}NO_2$	76,83	6,80	4,97

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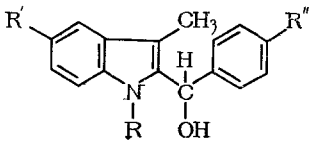
aryl-2-(3-methylindolyl) carbinol which formed was filtered, washed in water, and dried. Data on the derivatives obtained (V–VI) are given in Table 1.



CONCLUSIONS

In order to test for biological activity we synthesized several of the aryl-2-indolylcarbinol derivatives in high yield by reduction of 2-aroylindoles with zinc in alcoholic alkali.

LITERATURE CITED

1. J. E. Moore and E. Bull, Proc. Soc. Exp. Biol. (N. Y.), 90, 259 (1955); Chem. Abstr., 50, No. 2852 (1956).
2. K. Okaraki and T. Kawaguchi, J. Pharm. Soc. Jap., 72, 1400, (1952); Chem. Abstr., 47, No. 1883 (1953).
3. Belgian Patent No. 637355, 1964; Chem. Abstr., 62, No. 7731 (1965).
4. D. A. Shirley and P. A. Roussel, J. Am. Chem. Soc., 75, 377 (1953).
5. V. I. Shvedov, V. V. Alekseev, and A. N. Grinev, Author's Certificate, 1967, No. 215217; Izobreteniya, No. 13, 20 (1968).
6. V. I. Shvedov, V. V. Alekseev, and A. N. Grinev, Khim.-Farm. Zh., No. 8, 8 (1968).