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NOTE

Synthesis of New Enamines and Its Microbial Activity

P.S. UTALE*, P.B. RAGHUWANSHI and A.G. DOSHI
P.G.T.D. (Chemistry)
Vidya Bharti Mahavidyalaya, C.K. Naidu Road, Camp, Amravati-444 602, India

2-Hydroxy substituted acetophenone condensed with dimethyl amine and diphenyl amine in ethanol medium in presences of conc. H_2SO_4 affords enamines. These compounds are tested against *test organisms Staphylococcus aureus, Streptoccous pyogenes, S. agalactiae, S. facecalis, Corynebacterium ulcerans, C. minuttissimum, Clostridium septicum, Clostridium tetari and Escherichia coli.*

The most versatile method for preparing enamines involves the condensation of aldehyde or ketone with secondary amine with azeotropic removal of water formed in the condensation. The reaction is catalyzed by the use of *p*-toluene sulphonic acid[1] and also K-10 montmorillonite clay in the synthesis of enamines.[2] Stereoselective synthesis of β-trifluoromethylated enamines occurs when quaternary ammonium salt having a polyfluoro alkenyl group reacts with secondary amines[3]. A template synthesis of stable conjugated primary enamines from ketones, nitrites and butadiene.[4]

Synthesis of stable tail to tail conjugated primary enamines containing heterane substituted.[5] chloroenamines shows biological activity.[6] The stereoselective synthesis of N,N-dialkyl enamines via unsymmetrical Tm(II) Amides.[7] Enamines form an important class of organic intermediates from the point of view of organic synthesis. They are widely used for selective alkylation and acylation of aldehydes and ketones and for the synthesis of various biologically active natural products.[8, 9] Recently a simple and efficient method for the synthesis of enamines by using new solids supported acid catalyst Envirocat EPZ 10^R in high yield.[10]

We report the synthesis of new enamines when 2-hydroxy substituted acetophenone condenses with dimethylamine or diphenylamine in ethanol medium in presence of concentrated H_2SO_4.

2-Hydroxy-3-bromo-5-chloroacetophenone (1a) (0.01 mole) was dissolved in 20 mL ethanol. To this (0.01 mole) diphenylamine was added. To this mixture 4-5 drops of concentrated H_2SO_4 were added. The reaction mixtured was refluxed

*P.S. Utale, c/o Shersing Rajput, At. Post. Tiosa, Tal. Tiosa, Dist. Amravati, 444 903, India

for 2–3 h. The hot mixture was cooled, diluted with water and the crude product obtained was crystallised from ethanol to get a compound IIa.

Properties of Compound IIa

1. The compound (IIa) is dark green crystalline compound, m.p. 94°C.
2. It gives red colouration with ethanolic $FeCl_3$ solution indicating the presence of free OH group.
3. The analytical result shows that the molecular formula of the compound is $C_{20}H_{15}ONClBr$, the molecular weight being 400.5.
4. R_f value of the compound was found to be 0.94 in ethanol.
5. UV (λ_{max}): 356, 286, 264 nm corresponding to $\pi \rightarrow \pi^*$ and $n \rightarrow \pi^*$ transitions.
6. IR: (ν_{max})3350–3300 ν(—OH), 1680 ν(C=C, Ar—H), 690 ν(C—Cl) and 610 cm^{-1} ν(C—Br).
7. PMR: 4.8δ (s, 2H, —C=CH_2), 6.8 to 7.8 (m, 12H, Ar—H) and 12.85δ (s, 1H, Ar—OH).

From the properites compound IIa is 1-(2-hydroxy-3-bromo-5-chlorophenyl) ethenyl diphenylamine. Other enamines are prepared by the same method. These are listed in Table-1.

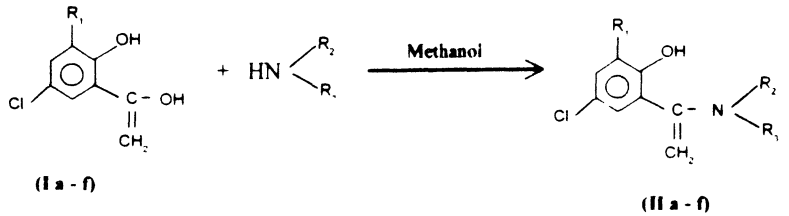

TABLE-1
PHYSICAL PROPERTIES OF ENAMINES

Compd.	R_1	R_2	R_3	m.p. °C	Yield (%)	Molecular formula	m.w.
IIa	Br	C_6H_5	C_6H_5	94	80	$C_{20}H_{15}ONClBr$	400.25
IIb	Br	CH_3	CH_3	118	78	$C_{10}H_{11}ONClBr$	276.50
IIc	H	CH_3	CH_3	58	75	$C_{10}H_{12}ONCl$	197.00
IId	H	C_6H_5	C_6H_5	272 (b.p.)	70	$C_{20}H_{16}ONCl$	321.50
IIe	NO_2	CH_3	CH_3	79	82	$C_{10}H_{11}O_3N_2Cl$	224.50
IIf	NO_2	C_6H_5	C_6H_5	66	80	$C_{20}H_{15}O_3N_2Cl$	366.50

These compounds were tested against test organism. The minimum inhibitory concentration (MIC) values were determined by serial dilution method[11, 12] and found that all these enamines showed activity for these test organism.

TABLE-2
MINIMUM INHIBITORY CONCENTRATION OF ENAMINES (% MIC) VALUES

Comp.	*S. aureus*	*S. pyogenes*	*S. agalactiae*	*S. faecalis*	*C. ulcerans*	*C. minutti-ssimum*	*C. septicum*	*C. tetari*	*E. coli*
IIa	0.37	0.40	0.42	0.39	0.15	0.21	0.10	0.12	0.38
IIb	0.36	0.36	0.39	0.41	0.21	0.22	0.10	0.10	0.36
IIc	0.38	0.35	0.34	0.20	0.08	0.08	0.04	0.08	0.12
IId	0.40	0.38	0.36	0.24	0.12	0.10	0.08	0.12	0.19
IIe	0.42	0.36	0.32	0.20	0.18	0.15	0.10	0.15	0.25
IId	0.42	0.42	0.36	0.29	0.19	0.20	0.22	0.18	0.30

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