hot water. A solution of the oxime (0·1 M) was prepared in 50% aqueous ethanol. Stock solutions (0·01 M) of uranyl acetate and fluoride were used in this investigation.

ELICO instrument SPECTROCOL Model CL 23 was employed for all absorbance measurements.

Recommended Procedure

To 1·5 ml of uranium solution taken in a 25 ml measuring flask, 2 ml of acetate buffer (pH 5·9) and 2 ml of oxime solution were added. To this, known amounts of the standard fluoride solution were added and the contents made upto the mark with distilled water. The absorbance of the solutions was measured at 400 nm against distilled water as blank. The data obtained showed that the absorbance is proportional to the amount of fluoride (Fig. 1), indicating the suitability of the reaction for the determination of fluoride.

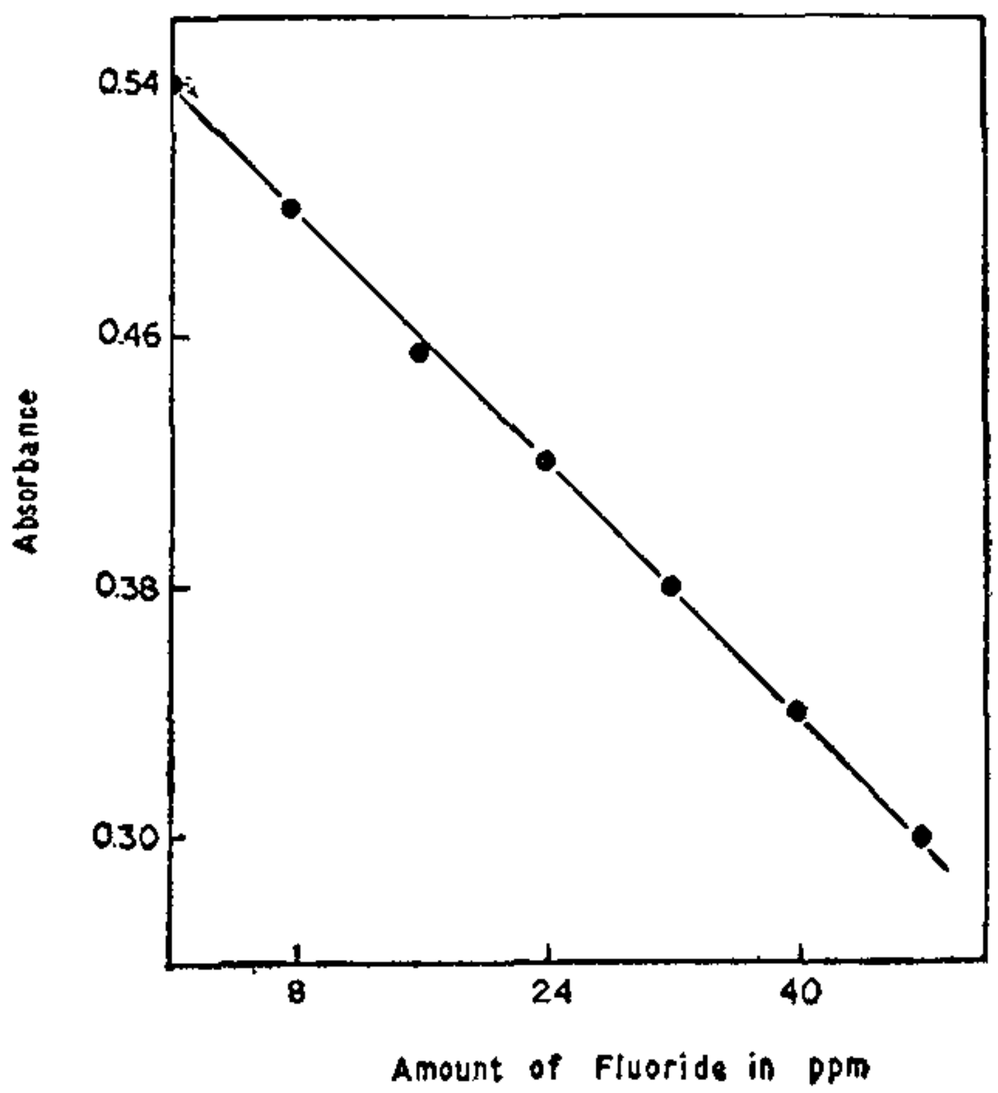

FIG. 1. Plot of amount of fluoride *versus* absorbance.

The colour formation of the complex is rapid and the absorbance of the complex is stable for more than 72 hours. The standard deviation is 0·015. The molar absorptivity and the Sandell sensitivity[7] are 900 litre mole^{-1} cm^{-1} and 0·265 μg/cm^2 respectively.

Interference

Br^-, Cl^- and NO_3^- did not interfere in the determination even when present in large amounts. Iron(III), aluminium(III), citrate, oxalate, carbonate, bicarbonate, phosphate interfere. SO_4^{--} interferes if the amount is greater than 3,500 ppm.

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A FACILE ONE-STEP SYNTHESIS OF 2-ARYL AND HETERYL-1, 8-NAPHTHYRIDINES

SEVERAL 1, 8-naphthyridines have been found to possess diverse types of biological activities including bacteriocidal[1] and antimalarial[2] properties. It has also been known that 1-ethyl-3-carboxy-7-methyl-1, 8-napththyridin-4-one (nalidixic acid) and its derivatives are particularly effective against gram-negative bacteria[3]. Taking into account the varied activities exhibited by 1, 8-naphthyridine system, a series of 2-aryl and heteryl 1, 8-naphthyridines (II) have been made in the present investigation, with a view to see the effect of aryl and heteryl moieties on the biological activity of naphthyridine molecule.

2-Phenyl-1, 8-naphthyridine was earlier synthesized by Hawes and Wibberley[4] by condensing 2-aminonicotinaldehyde with benzoylacetonitrile to afford 2-phenyl-3-cyano-1, 8-naphthyridine. The cyano group was then removed by first hydrolysing it to carboxyl under alkaline conditions and subsequent thermal decarboxylation. Except for this, there seems to be no other reference available in literature on the synthesis of the title compounds.

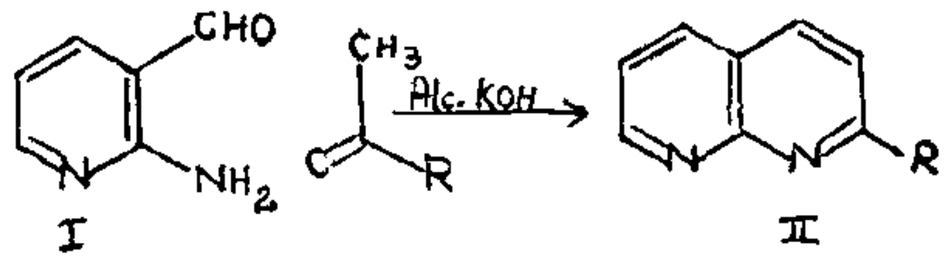
The present communication deals with a facile one-step synthesis of 2-aryl and heteryl-1, 8-naphthyridines unlike Hawes and Wibberley's (*loc. cit.*) procedure which consisted of three steps. This method involves the direct condensation of 2-aminonicotinaldehyde (I) with appropriate aryl methyl ketone in the presence of few drops of 20% alcoholic potassium hydroxide using ethanol as solvent. The progress of the reaction was observed after every hour on TLC using benzene as solvent system, and refluxing was stopped when

TABLE I

2 Aryl and heteryl-1, 8-naphthyridines (II)

Sl. No.	1-8-Naphthyridine	mp (0 C)	Yield %	Solvent	Mol. Formula	Analysis					
						Calculated			Found		
						C	H	N	C	H	N
1.	2 *Phenyl*	116[1]	80	Cyclohexane	.	..	..	..	..	..	..
2.	2 *p*-Methylphenyl	147	75	Cyclohexane	$C_{15}H_{12}N_2$	81·83	5·45	12·72	81·61	5·41	12·81
3.	2 *p*-Methoxyphenyl	148	72	Benzene	$C_{15}H_{12}N_2O$	76·28	5·08	11·87	76·37	5·13	11·98
4.	2 *p*-Hydroxyphenyl	254	78	Ethylacetate	$C_{14}H_{10}N_2O$	75·65	4·50	12·61	75·27	4·51	12·76
5.	2-*o*-Hydroxyphenyl	188	76	Benzene	$C_{14}H_{10}N_2O$	75·65	4·50	12·61	75·43	4·52	12·10
6.	2-*p*-Nitrophenyl	263	82	Chloroform	$C_{14}H_9N_3O_2$	66·92	3·58	16·73	67·21	3·60	16·81
7.	2-*m*-Nitrophenyl	219	80	Ethanol	$C_{14}H_9N_3O_2$	66·92	3·58	16·73	67·17	3·58	16·93
8.	2-*p*-Bromophenyl	217	76	Benzene	$C_{14}H_9BrN_2$	58·96	3·15	9·83	60·00	3·21	9·74
9.	2-*p*-Chlorophenyl	202	75	Ethanol	$C_{14}H_9ClN_2$	70·00	3·75	11·67	69·77	3·81	11·86
10.	2-(α-Naphthyl)	134	78	Benzene/Pet. Ether	$C_{18}H_{12}N_2$	84·35	4·69	10·94	85·61	4·74	11·10
11.	2-(3-Pyridyl)	142	71	Benzene	$C_{13}H_9N_3$	75·36	4·34	20·29	75·04	4·09	20·64
12.	2-(2-Furyl)	146	68	Pet. ether	$C_{12}H_8N_2O$	73·47	4·08	14·29	74·04	4·11	13·89
13.	2-(2-Thienyl)	133	65	Benzene	$C_{12}H_8N_2S$	67·94	3·77	13·20	68·10	3·79	13·42

most of the starting material had reacted (2–3 hours). The corresponding 2-heteryl-1,8-naphthyridines have been obtained in good yields, when heteryl-methyl ketones were employed in the place of aryl methyl ketone. Heteryl substituents like pyridyl, furyl and thienyl were selected in view of their biological importance. The purity and homogeneity of these compounds was checked by TLC using benzene-methanol (95:5) as solvent system.



All the compounds prepared are listed in Table I along with the m.p., yield, solvent of crystallisation and analytical data.

Finally the 2-phenyl-1,8-naphthyridine was prepared by the procedure reported earlier[4] and was found to be identical in all respects (m.p., mmp and TLC) with our compound.

The mass spectrum of one representative in the series, *viz.*, 2-*p*-chlorophenyl-1,8-naphthyridine shows the molecular ion at m/e 240, thus supporting the structure. The NMR spectrum also supports the structural assignment.

The bacteriocidal, insecticidal and other activities which are under study will be reported later along with detailed spectral data.

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EFFECT OF β AND γ ISOMERS OF HEXACHLOROCYCLOHEXANE ON SOME LIVER AND KIDNEY ENZYMES IN ALBINO RATS

AMONG the various stereo isomers of hexachlorocyclohexane (BHC), the γ-isomer has both strong insecticidal action[1] and high mammalian acute toxicity[2]. β-Isomer, on the other hand, shows high chronic toxicity because of its long persistence and poor elimination[3], and thus