

SYNTHESIS AND SPECTROSCOPIC STUDIES ON 5-ARYLAMINO-1, 2, 3, 4-THIATRIAZOLES**RANA PARVEEN¹**

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ABSTRACT

Seven new 5-arylamino-1,2,3,4-thiatriazoles have been synthesized by cyclization of 4-aryl-3-semicarbazides and their structures were elucidated by various spectroscopic studies.

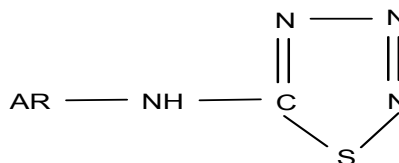
KEYWORDS: 5-arylamino-1,2,3,4-thiatriazoles, 4-aryl-3-semicarbazides

Certain 5-arylamino-1,2,3,4-thiatriazoles have been of research interest due to their ability to inhibit the activity of KB cells and their interesting biological activities 2-7. The present communication records the results of detailed study of seven new 5-arylamino-1,2,3,4-thiatriazoles.

SPECTROSCOPIC STUDIES

The ultraviolet spectra of several 5-arylamino-1,2,3,4-thiatriazoles have been determined using

methanol/ethanol as solvents. The absorption maxima of all these compounds have shown the characteristics peaks in the range of 230-300 nm. It could be seen from the UV absorption data that there is marked bathochromic shifts in the absorption band due to the introduction of arylamino group. UV spectra were measured in methanol/ethanol solvents. Spectra were recorded on Perkin-Elmer 202 automatic recording (Table 1).

Table 1: UV Absorption Data of Some 5-Arylamino-1, 2, 3, 4-Thiatriazoles

S. No.	AR Group	Data in nm		
1.	Thiazoly	234	260	330
2.	2,4, Dichlorophenyl	232	260	330(sh)
3.	2-Chloro-4-Nitrophenyl	232	255(sh)	358
4.	m-Cresolyl	232	262	300
5.	m-Tolyl	233	260	305
6.	2,5-Dichlorophenyl	233	265	302
7.	2-Nitro-4-Chlorophenyl	230	260	300

INFRARED SPECTROSCOPY

The infrared spectra of several 5-arylamino-1,2,3,4-thiatriazoles have been recorded. Characteristics absorption peaks show the presence of following groups;

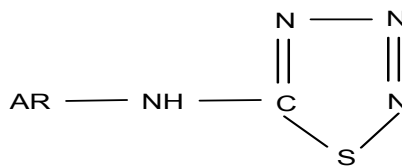
1. substituted phenyl group
2. -NH₂
3. cyclic C=N

4. cyclic N=C=S
5. cyclic C=S group

The details of IR absorptions are mentioned in Table 2. The IR spectra were recorded on Perkin-Elmer 720 Infrared Spectrophotometer and Perkin-Elmer 621 grating Infrared Spectrophotometer, solution spectra were measured in NUJOL MULLS and KBr disc.

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Table 2: IR Absorption Data of Some 4-Arylamino-1, 2, 3, 4-Thiatriazoles

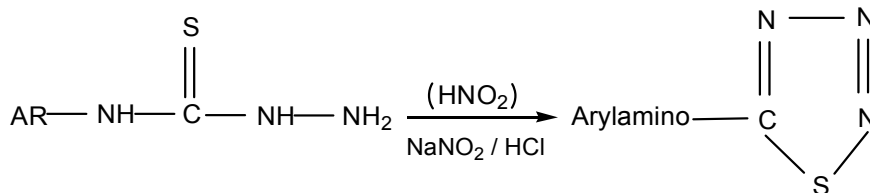


S. No.	AR Group	-N-H	Cyclic -N=C=S	Cyclic C=N-	Cyclic -N-N=C	Cyclic -S-	Others
1.	Thiazoly	3400	1450	1575	1265	1370 760	C-F 1200
2.	m-Cresolyl	3240	1470	1570	1265	1380 750	O-H 3240, 1380, 1180
3.	2-Chloro-4-Nitrophenyl	3225	1470	1565 1495	1260	1380 750	
4.	m-Tolyl	3225	1475	1565 1550	1255	1380 750	C-Cl 820
5.	2,5-Dichlorophenyl	3400	1475	1570 1580	1260	1350 750	C-CH ₃ 1440
6.	2,4-Dichlorophenyl	3300	1472	1565 1570	1265	1370 1365	C-Cl 820
7.	2-Nitro-4-Chlorophenyl	3320	1468	1570 1580	1270 1263	1365 1360	C-Cl 825 NO ₂ 1575 1340

RESULTS AND DISCUSSION

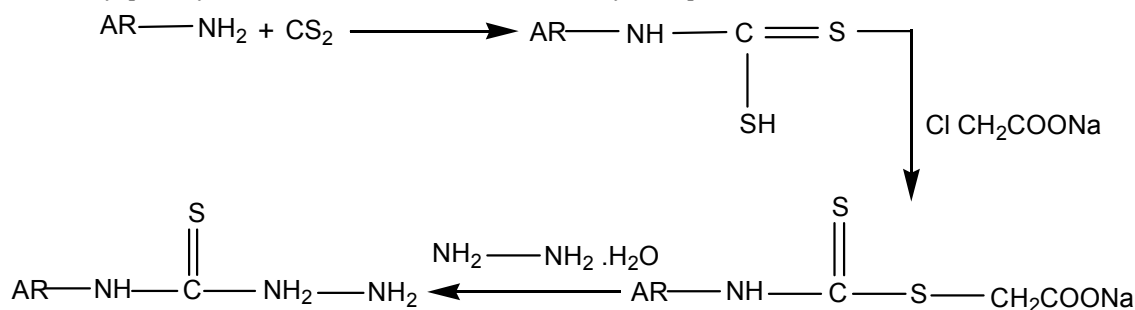
4-aryl-3-thiosemicarbazides required as starting material were synthesized by the method reported by

Kazakovet *al.*^[1] and used by Wahab and Rao^[4], which on being diotized with NaNO₂/HCl in absolute ethanol gave 5-arylamino-1,2,3,4-thiatriazoles. Structures were determined by spectroscopic method.



Synthesis - [A]: Aryl thiosemicarbazides were synthesized by primary aromatic amines, these amines

were treated with CS₂ sodium chloroacetate and hydrazine hydrate, poured the content in ice water and filtered.



The oxidative cyclization of these aryl thiosemicarbazides in the presence of HNO₂ below °C gave 5-arylamino-1,2,3,4-thiatriazoles [B] Table 3.

The melting point of all compounds were taken by the capillary method and are uncorrected. The purity of the compounds was confirmed by the thin layer chromatography.

Table 3: Synthesis of Various 5-arylamino-1, 2, 3, 4-thiatriazoles

S. No.	A.R. Group	Mol. Formula	Yield %	M.P.	Analysis
1.	Thiazoly	C ₄ H ₃ N ₅ S ₂	70	150	Found 25.96 2.12 37.81 Cal. 25.94 2.16 37.83
2.	2,4, Dichlorophenyl	C ₇ H ₄ N ₄ SCl ₂	85	177	Found 34.87 1.61 22.85 Cal. 34.14 1.62 22.76
3.	2-Chloro-4-Nitrophenyl	C ₇ H ₄ N ₅ SClO ₂	75	85	Found 32.61 1.52 27.00 Cal. 32.68 1.54 27.23
4.	2-Nitro-4-Chlorophenyl	C ₇ H ₄ N ₅ SClO ₂	70	80	Found 32.61 1.51 27.00 Cal. 32.66 1.55 27.23
5.	m-Tolyl	C ₄ H ₃ N ₅ S ₂	88	110	Found 52.13 4.32 30.20 Cal. 52.17 4.34 30.43
6.	2,5-Dichlorophenyl	C ₇ H ₄ N ₄ SCl ₂	80	170	Found 34.10 1.61 27.71 Cal. 34.14 1.62 22.76
7.	m-Cresolyl	C ₈ H ₈ N ₄ SO	65	185	Found 46.11 3.81 26.95 Cal. 46.15 3.84 26.92

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