International Journal of Pharmaceutical Research and Applications
Volume 9, Issue 3 May-June 2024, pp: 1647-1648 www.ijprajournal.com ISSN: 2456-4494

Synthesis, Biological Activity of Azaarene Derivative

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Date of Submission: 28-05-2024 Date of Acceptance: 05-06-2024

ABSTRACT:
The 5,6,7 trinitro-2,3bis (2'-pyridy) quinoxaline was synthesized by reaction of 2,2' pyridyl with phenylenediamine. The azaarene derivative was characterized by elemental analysis ,^{1}H-NMR , mass spectroscopy and infrared. The biological activity was compared with amikacin as standard .
Keywords: quinoxaline, biological activity.

I. INTRODUCTION:

Alkyl azaarene derivatives such as antituberculosis[1] anticancer[2-4] , anti-inflammatory[5], and antiHIV[5] . 5,6,7triethylazaaren compounds are associated with broad spectrum of pharmacological activities such as antibacterial and antifungal [6] .among the broad range of aza-heterocycles , quinolines have been explored more than any other aza-heterocycles in organic and medicinalchemistry[7]. Quinoline derivatives are known to exhibit biological activities such as antimalarial,antibacterial,antifungal, anti-inflammatory,anticancer,anti HIV activities[8-17].

II. EXPERIMENTAL

Instrumentation:

Infrared measuments were carried out on unicammattson 1000FTIR spectrometer using KBr pellets. Nuclear magnetic resonance measurments were performed on a spectrospin Bruker AC200MHz spectrometer sample were dissolved in DMSOof using TMSas internal refrence . mass spectra of the compound (70ev,EI) were carried out on ashimadzu QP-2010 plus spectrometer.elemental analysiswere performed on perkin -elmer2400 CHN elemental analyzer.

Synthesis of 5,6,7 trinitro2,3-bis(2'-pyridyl) quinoxaline:

(0.1mole)of 2,2'pyridil and (0.1mole) of 3,4,5trinitro 1.2 phenylendiamine were mixed in 150ml ethanol.the mixture was heated to reflux for 10hrs. The reaction mixture was cooled and brown residue was separated by filtration .The solid was recrystallized from ethanol.

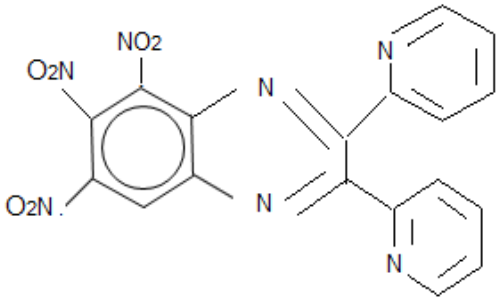

Table 1 : physical characterization of azaarene derivative

MP.C° Colour	Solventyield %	MF(M.wt)	Elementedanalysiscalcd/found		
			C%	H%	N%
223-225 Brown	Ethanol 78	$C_{15}H_9N_2OBr_3$ 365,113	69,04 68,75	2,46 2.05	15.34 15.17

Table 2: spectroscopic data forazaarene derivative

IR(KBr)ʊcm^{-1}	^{1}HNMRδ(PPm)	MS,Mm/z(%)relevan
ʊC=N1541 ʊC=C 1490	8,09,7,55,7,70(M,Pyran ring) 6,05(S,Pyran ring)	[M+1]366(55,11),[M]365, (70,36%),345(83,22%), 299(63,25%),285(37,186)

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III. RESULTS AND DISCUSSION:

The infrared spectrum of the new compound table(2) showed a strong band at 1569cm^{-1} due to C=N and strong band at 1569cm^{-1}due to C=C . the ^{1}HNMR spectrum of azaarene derivative table (2) in deuterated DMSO-d_6 showed singlet signal at 6.11ppm due to protons in phenyl ring of quinoxaline as well as multiples 6,89,7,40,7,90.ppm due to protons of pyridyl rings. The mass spectra of the azaarene derivative showed the following peaks of m/z values followed by % relative a bandances [M+1] 366 (55.11), M365(70,36),345(83,22) , 29(63,25), 285(37,18) 251(30,09), 78(100).

Antimicrobial activity: the azaarene derivative was screenea for has antibacterial activity using the agar diffusion technique[18]. A2,5mg/ml solution in DMF was used .the tested organisms were two gram positive bacteria two gram negative bacteria and fungi , candida albicans . the results of antibacterial and antifungal are given in table (3).

Table3: the inhibition zone of some azaarena derivative

Compound/ standred	Staphylococcus aureus (+ gram)	Escherichia coli (- gram)	Aspergillus f	Candida albicans
azaarena	18	22	24	11
Amikacin	16	29	33	14

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