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Synthesis of some novel s-triazine based chalcones and their derivatives

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ABSTRACT

Some new condensed heterocycles, synthesized *via* condensation of 2,4-bis-(phenylamino)-6-(4'-acetylphenylamino)-*s*-triazine **(5)** with different aromatic aldehydes yield chalcones **(6a-e)**. These on cyclisation with guanidine nitrate in presence of alkali and 2-aminothiophenol in presence of few drops of glacial acetic acid gives the corresponding aminopyrimidines **(7a-e)** and 1,5-benzothiazepines **(8a-e)** respectively. The constitutions of newly synthesised compounds have been established on the basis of their elemental analysis, IR and ^{1}H NMR spectral data.

KEYWORDS

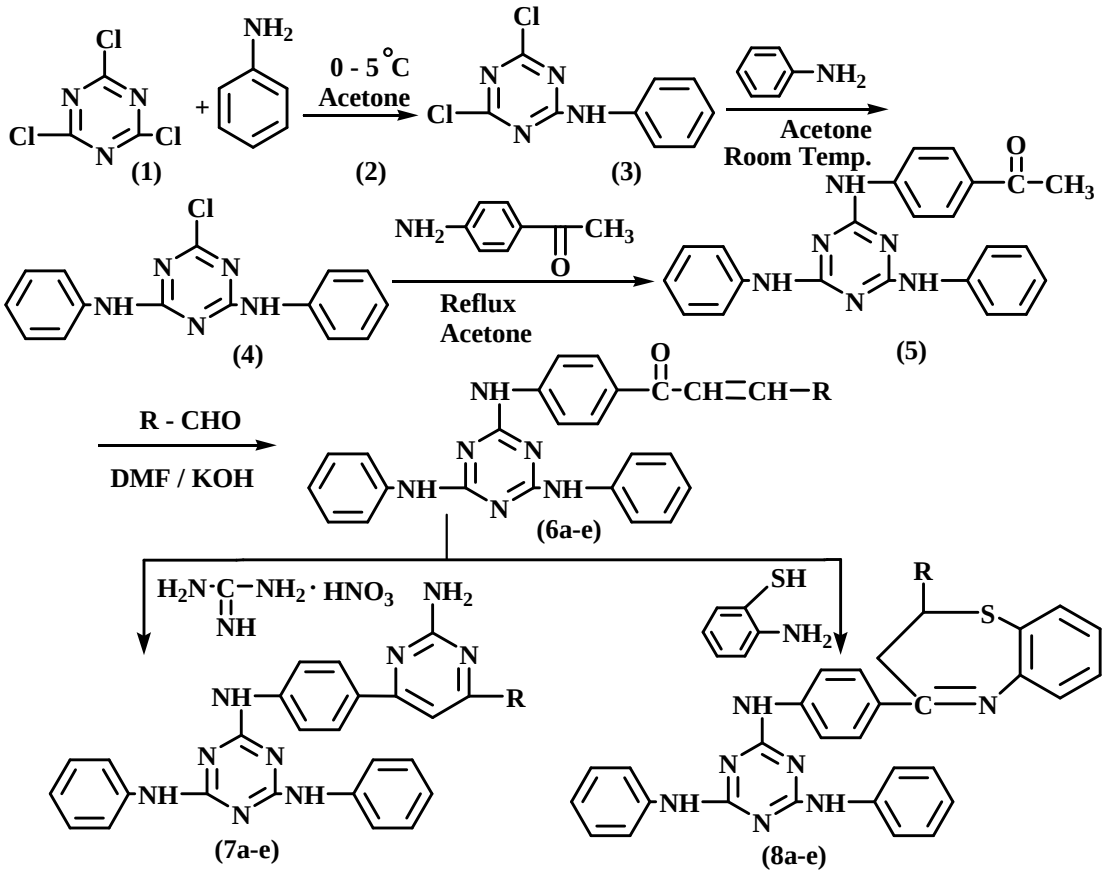
Chalcones;
Aminopyrimidines;
1,5-Benzothiazepines.

INTRODUCTION

In continuation of our work on some novel *s*-triazine based chalcones[1] and their derivatives, we herein, report the synthesis of aminopyrimidines **(7a-e)** and 1,5-benzothiazepines **(8a-e)**. The biological profile of pyrimidine derivative is very extensive. Many classes of chemotherapeutic agents containing pyrimidine neucleus are in clinical use. Some of aminopy rimidines have been found to possess antifungal[2], anticonvulsant, antitumor[3], antibacterial and anticancer[4] activity. 1,5- benzothiazepines are gaining more attention due to their pharmacological significance. Compounds like diltiazem[5] and clentiazem[6] are well explored as effective cardiovascular drugs and found to contain 1,5-benzothiazepine neucleus.Some of the benzothiazepine have been claimed to exhibit antifungal, antibacterial[7],anticonvulsant, antispasmodic[8], neurolaptic[9], antidepresant[10] and CNS activities.

The IR spectrum of compound **(6e)** shows the characteristic band at 1647cm^{-1} due to –C=O group. The IR spectrum of compounds **(7e)** and **(8e)** shows the characteristic band at 1575cm^{-1} and 1573cm^{-1} due to –C=N group respectively. The IR spectrum of compound **(7e)** shows the characteristic bands in the region of 3300-3400 cm^{-1} which indicate the presence of primary amine. The IR spectrum of **(7e)** and **(8e)** do not show any absorption bands in the region of 1600-1700cm^{-1} which indicate the absence of –C=O group. The NMR spectrum of **(7e)** shows a singlet at δ 5.1 due to –NH_2 protons.

In the present work, we report the reaction of 2,4-bis-(phenylamino)-6-(4'-acetylphenylamino)-*s*-triazine **(5)** with different substituted aromatic aldehydes to form chalcones **(6a-e)**. Compound **(5)** is prepared by the condensation of cyanuric chloride and aniline at 0-5ºC to form **(3)**, which further reacts with aniline at room temperature to form **(4)** which is treated with 4-aminoacetophenone to form compound **(5)**. Chalcones **(6a-e)** are cyclised with guanidine nitrate in presence of alkali and 2-aminothiophenol in presence of few drops of glacial acetic acid gives aminopyrimidines **(7a-e)** and



SCHEME

1,5-benzothiazepines **(8a-e)** respectively (SCHEME).

EXPERIMENTAL

All the melting points were determined in an open capillary and are uncorrected. The IR spectra were recorded on Perkin-Elmer 237 spectrophotometer. ^{1}H NMR spectra on a Bruker Avance DPX 300 MHz spectrometer with $CDCl_3$ as a solvent, using TMS as internal reference. Purity of the compounds were checked on TLC using silica gel-G. Elemental analysis was performed on Carlo Erba-1108 analyzer.

Preparation of 2-phenylamino-4,6-dichloro-*s*-triazine[11,12] (3)

Aniline(0.01mole) was added slowly to cyanuric chloride(0.01mole) in acetone(30ml) with constant stirring for 4 hours at 0 to 5°C. Then sodium carbonate (0.005mole) dissolved in water(10ml) was added dropwise to neutralize HCl evolved during the reaction. Finally the contents were poured into crushed ice. The solid separated out was filtered, washed with water, dried and recrystallized from alcohol to give (3). Yield 86%; m.p. 196°C.

Preparation of 2,4-bis-(phenylamino)-6-chloro-*s*-triazine (4)

Aniline (0.01mole) was added slowly to compound **(3)** (0.01mole) in acetone(35ml) with constant stirring for 6 hours at room temperature. Then sodium carbonate (0.005 mole) dissolved in water (10 ml) was added dropwise to neutralize HCl evolved during the reaction. Finally the contents were poured into crushed ice. The solid separated out was filtered, washed with water, dried and recrystallized from alcohol to give (4). Yield 80%; m.p. 179°C; IR(KBr)cm^{-1} : 772(C-Cl), 1359(C-N), 805(C-N, s-triazine); ^{1}H NMR($CDCl_3$) δppm : 7.20 to 7.80(m, 10 Ar-H and 2 NH).

Preparation of 2,4-bis-(phenylamino)-6-(4'-acetylphenylamino)-*s*-triazine (5)

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TABLE : Physical and analytical data of compounds (6a-e), (7a-e) and (8a-e)

No.	R	M.P. (°C)	Yield (%)	Molecular formula	Elemental analysis found/(calcd.)%		
					C	H	N
6a	3,4,5-Trimethoxyphenyl	112	78	$C_{33}H_{30}N_6O_4$	68.97(68.99)	5.24(5.23)	14.62(14.63)
6b	3-Phenoxyphenyl	100	72	$C_{36}H_{28}N_6O_2$	74.99(75.00)	4.87(4.86)	14.60(14.58)
6c	3-Nitrophenyl	186	76	$C_{30}H_{23}N_7O_3$	68.02(68.05)	4.36(4.35)	18.52(18.53)
6d	3-Bromophenyl.	160	70	$C_{30}H_{23}N_6OBr$	63.96(63.94)	4.11(4.09)	14.91(14.92)
6e	3-Methoxyphenyl	119	68	$C_{31}H_{26}N_6O_2$	72.36(72.37)	5.03(5.06)	16.35(16.34)
7a	3,4,5-Trimethoxyphenyl	154	64	$C_{34}H_{31}N_9O_3$	66.54(66.56)	5.05(5.06)	20.53(20.55)
7b	3-Phenoxyphenyl	125	67	$C_{37}H_{29}N_9O$	72.23(72.20)	4.71(4.72)	20.52(20.49)
7c	3-Nitrophenyl	158	58	$C_{31}H_{24}N_{10}O_2$	65.51(65.49)	4.24(4.23)	24.63(24.65)
7d	3-Bromophenyl	168	62	$C_{31}H_{24}N_9Br$	61.78(61.79)	4.02(3.99)	20.96(20.93)
7e	3-Methoxyphenyl	143	64	$C_{32}H_{27}N_9O$	69.45(69.44)	4.86(4.88)	22.79(22.78)
8a	3,4,5-Trimethoxyphenyl	103	68	$C_{39}H_{35}N_7O_3S$	68.70(68.72)	5.15(5.14)	14.41(14.39)
8b	3-Phenoxyphenyl	89	61	$C_{42}H_{33}N_7OS$	73.77(73.79)	4.81(4.83)	14.37(14.35)
8c	3-Nitrophenyl	80	59	$C_{36}H_{28}N_8O_2S$	67.94(67.92)	4.41(4.40)	17.59(17.61)
8d	3-Bromophenyl	98	58	$C_{36}H_{28}N_7BrS$	64.47(64.48)	4.16(4.18)	14.65(14.63)
8e	3-Methoxyphenyl	96	66	$C_{37}H_{31}N_7OS$	71.51(71.49)	4.97(4.99)	15.79(15.78)

4-Aminoacetophenone (0.01mole) and compound **(4)** (0.01mole) were dissolved in acetone (40ml). The reaction mixture was refluxed for 6 hours, cooled and poured into crushed ice. Then sodium carbonate (0.005) dissolved in water (10ml) was added to neutralize HCl evolved during the reaction. The solid separated out was filtered, washed with water, dried and recrystallized from alcohol to give **(5)**.

Yield 75%; m.p. 218°C; IR(KBr)cm^{-1} : 1662(C=O), 1355(C-N), 805(C-N, *s*-triazine); ^{1}H NMR($CDCl_3$) δppm : 2.6(s, 3H, -$COCH_3$), 7.0 to 7.95(m, 14 Ar-H and 3 NH).

Preparation of 2,4-bis-(phenylamino)-6-[4'-{3''-(3'''-methoxyphenyl)-2''-propenon-1''-yl}-phenyl amino]-*s*-triazine (6e)

Compound **(5)** (0.01mole) was dissolved in DMF (30 ml) and 3-methoxybenzaldehyde (0.01 mole) was added to it. Then solution of KOH (5ml of 40%) was added to the reaction mixture with constant stirring at room temperature. After 24 hours the reaction mixture was poured into crushed ice and neutralize with HCl. The product separated out was filtered, washed with water, dried and recrystallized from alcohol to give **(6e)**.

Yield 68%; m.p. 119°C; IR(KBr)cm^{-1}: 1647(C=O), 1595(-CH=CH-, str.), 1340(C-N), 812(C-N, s-triazine); ^{1}H NMR($CDCl_3$) δppm : 3.80(s, 3H, -OCH_3), 6.90(d, lH, -CO-CH=), 7.15 to 7.80(m, 18 Ar-H and 3 NH), 8.05(d, 1H, Ar-CH=). Anal.Calcd for $C_{31}H_{26}N_6O_2$: C, 72.37; H, 5.06; N, 16.34. Found: C, 72.36; H, 5.03; N, 16.35.

Similarly the remaining compounds **(6a-d)** were prepared by this method. Their physical and analytical data are given in TABLE.

Preparation of 2,4-bis-(phenylamino)-6-[4'-{2''-amino-6''-(3'''-methoxyphenyl)-pyrimidin-4''-yl}-phenylamino]-*s*-triazine (7e)

Compound **(6e)** (0.01mole) was dissolved in alcohol (25ml) and guanidine nitrate (0.01mole) was added to it. Then solution of KOH (5ml of 40%) was added to the reaction mixture and refluxed for 10 hours. The reaction mixture was then cooled , poured into crushed ice and product separated out was filtered, washed with water, dried and recrystallized from alcohol to give **(7e)**.

Yield 64%; m.p. 143°C; IR(KBr) cm^{-1} : 3398 (-NH_2), 1575(C=N), 806(C-N, *s*-triazine); ^{1}H NMR($CDCl_3$) δppm : 3.85(s, 3H, -OCH_3), 5.1(s, 2H, -NH_2), 6.90 to 8.15(m, 19 Ar-H and 3NH). Anal.Calcd for $C_{32}H_{27}N_9O$: C, 69.44; H, 4.88; N, 22.78. Found: C, 69.45; H, 4.86; N, 22.79.

Similarly the remaining compounds**(7a-d)** were prepared by this method. Their physical and analytical data are given in TABLE.

Preparation of 2,4-bis-(phenylamino)-6-[4'-{2''-(3'''-methoxyphenyl)-2'',3''-dihydro-1'',5''-benzo thiazepin-4''-yl}-phenylamino]-s-triazine (8e)

Compound **(6e)** (0.01mole) was dissolved in alcohol (25ml) and 2-aminothiophenol (0.01mole) was added to it. Then few drops of glacial acetic acid was

added to the reaction mixture and refluxed for 10 hours. The reaction mixture was then cooled, poured into crushed ice and product separated out was filtered, washed with water, dried and recrystallized from alcohol to give **(8e)**.

Yield 66%; m.p. 96°C; IR(KBr) cm^{-1}: 1573 (C=N), 731(C-S-C), 806(C-N, *s*-triazine); ^1H NMR($CDCl_3$) δppm : 3.10(dd, 2H, CH_a), 3.36(dd, 2H, CH_b), 3.86 (s, 3H, $-OCH_3$), 5.00(dd, 1H, CH_2-CH), 6.90 to 8.10(m, 22 Ar-H and 3NH). Anal. Calcd for $C_{37}H_{31}N_7OS$: C, 71.49; H, 4.99; N, 15.78. Found: C, 71.51; H, 4.97; N, 15.79.

Similarly the remaining compounds **(8a-d)** were prepared by this method. Their physical and analytical data are given in Table.

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REFERENCES

[1] A.Solankee, I.Thakor; Indian J.Chem., **45B**, 517 **(2006)**.
[2] M.N.Ghosh; Fundamentals of Experimental Pharmacology, Ed II, Scientific Book Agency, Kolkata, 153 **(1984)**.
[3] A.Zidermane, G.Duburs, A.Zilbere, R.Verpele, J.Uldrikis; Chem.Abstr., **75**, 47266e **(1971)**.
[4] V.S.Jolly, G.D.Arora, P.Talwar; J.Indian Chem.Soc., **67**, 1001 **(1990)**.
[5] K.Kinoshita, J.D.Harse, V.M.Braimridge, S.A. Manning, C.J.Cardiol; **4(1)**, 37 **(1998)**.
[6] Chem.Abstr., **116**, 165988e **(1992)**.
[7] J.Krapcho; US.Pat., 3455 902(Cl.260-239.3; C 07d); Chem.Abstr., **71**, 113001 **(1969)**.
[8] J.Krapcho; US.Pat., 3361 750 **(1968)**; Chem.Abstr., **69**, 36194 **(1968)**.
[9] J.B.Renz, P.Jean, H.Winkler; Fr.Pat., 1535 533 (Cl.C 07d, A, 61K) **(1968)**; Chem.Abstr., **71**, 50010 **(1969)**.
[10] J.Bernstein; Brit.Pat., 1 198 825 (Cl.C 07d) **(1970)**; Chem.Abstr., **73**, 77294 **(1970)**.
[11] A.Solankee J.Patel; Indian J.Chem., **43(B)**, 1580 **(2004)**.
[12] A.Solankee, K.Kapadia, H.Patel, Y.Prajapati, P.Solankee, S.Solankee; Indian J.Heterocycl.Chem., **16**, 287 **(2007)**.