International Journal for Pharmaceutical Research Scholars (IJPRS)

V-4, I-4, 2015 ISSN No: 2277 - 7873

RESEARCH ARTICLE

Synthesis of Credible Schiff Base Derivatives

Chauhan V*[1], Joshi K[2]

[1]*Research Scholar, JJT University, Rajasthan, India.*

[2]*Shree DKV Arts & Science College, Jamnagar, Gujarat, India.*

Manuscript No: IJPRS/V4/I4/00188, Received On: 25/10/2015, Accepted On: 04/11/2015

ABSTRACT

Synthesis of a series of ***(E)-N-(substitutedbenzylidene) - (5-chloro, 2, 4 - disulfamoyl) benzenamine (3a-h)*** was achieved from different Aldehydes and using catalytical amount of acetic acid in methanol the product obtained was isolated. So to the excellent yield. The structures of the products were supported by FTIR, ^{1}H NMR and mass spectral data.

KEYWORDS

5-Chloro-2,4-Disulfamoylaniline, Aldehyde, Acetic Acid, Methanol Only Refluxed

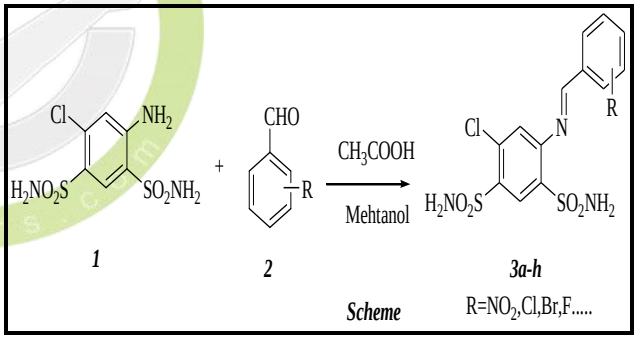
INTRODUCTION

Schiff bases are considered important compound because of their wide range of biological activities, and also because of their use as ligands in conjunction with transition metals. Schiff base ligands usually coordinate to a metal ion through the imine nitrogen atom, but coordination via, other functional groups, e.g. through oxygen or carbon, has also been reported[1,2]. Schiff base compounds are a class of important materials used as pharmaceuticals and in various medicinal fields of interest[3-5]. Schiff bases have also been used as versatile ligands in coordination chemistry[6-8]. During the last few decades, there has been a considerable interest in the chemistry of Schiff base compounds[9-10].

Synthesis, characterization and structural activity relationship of Schiff bases have been studied Worldwide as it is proven that C=N linkage in Schiff bases is an essential feature for bioactivity[11].

***Address for Correspondence:**
Vikas Chauhan,
Research Scholar JJT University,
Rajasthan, India.
E-Mail Id: ram.haresh2007@gmail.com

Schiff bases have been reported to possess noteworthy antibacterial[12], antifungal[13], anticancer[14], urease inhibition[15], antioxidant[16-21] and antiglycation[22–24] activities.



Scheme

EXPERIMENTAL

Typical Experimental Procedure

5-Chloro-2, 4-Disulfamylaniline add in to methanol and add benzaldehyde few drop of acetic acid. Reflux the mass for 15 hrs. Check progress of reaction mass by TLC. After complies the reaction cooled at RT and dump the reaction mass into cooled water. Isolate the schiff base of 5-chloro-2, 4-disulfamoylaniline by filtration and washed with water till neutral pH of filtration. After dried the schiff base of 5-chloro-2, 4-disulfamoylaniline.

(E)-N-(benzylidene) - (5-chloro, 2, 4-disulfamoyl) benzenamine (3a)

Yield: 63%; MP 223 ºC; MS: *m/z* 374; IR (cm^{-1}): 3357 (N-H asymmetrical stretching of NH_2), 3107 (N-H symmetrical stretching of NH_2), 3003 (Aromatic symmetrical stretching of C-H), 1595 and 1529 (C=C stretching of aromatic ring), 1346 (S=O asymmetrical stretching of SO_2NH_2), 1278 & 1110 (S=O symmetrical stretching of SO_2NH_2), 1068 (C-H in plane deformation of aromatic ring), 914 (S-N asymmetrical stretching of SO_2NH_2), 786 (C-H out of plane deformation of mono substituted benzene ring), 671 (C-Cl stretching); Anal. Calcd. $C_{13}H_{12}ClN_3O_4S_2$; C, 41.77; H, 3.24; Cl, 9.48; N, 11.24; O, 17.12; S, 17.15; Found: C, 41.76; H, 3.25; Cl, 9.49; N, 11.21; O, 17.17; S, 17.10 %.

(E)-N-(3-bromobenzylidene)-(5-chloro, 2, 4-disulfamoyl) benzenamine (3b)

Yield: 53%; MP 210 ºC; MS: *m/z* 453; IR (cm^{-1}): 3350 (N-H asymmetrical stretching of NH_2), 3109 (N-H symmetrical stretching of NH_2), 3013 (Aromatic symmetrical stretching of C-H), 1559 and 1520 (C=C stretching of aromatic ring), 1341 (S=O asymmetrical stretching of SO_2NH_2), 1206 & 1100 (S=O symmetrical stretching of SO_2NH_2), 1061 (C-H in plane deformation of aromatic ring), 911 (S-N asymmetrical stretching of SO_2NH_2), 783 (C-H out of plane deformation of mono substituted benzene ring), 667 (C-Cl stretching), 603 (C-Br stretching); Anal. Calcd. $C_{13}H_{11}ClBrN_3O_4S_2$; C, 34.49; H, 2.45; Br, 17.65; Cl, 7.83; N, 9.28; O, 14.14; S, 14.17; Found: C, 34.50; H, 2.46; Br, 17.69; Cl, 7.87; N, 9.30; O, 14.10; S, 14.10%.

(E)-N-(4-bromobenzylidene)-(5-chloro, 2, 4-disulfamoyl) benzenamine (3c)

Yield: 57%; MP 223 ºC; MS: *m/z* 453; IR (cm^{-1}): 3345 (N-H asymmetrical stretching of NH_2), 3113 (N-H symmetrical stretching of NH_2), 3003 (Aromatic symmetrical stretching of C-H), 1520 (C=C stretching of aromatic ring), 1351 (S=O asymmetrical stretching of SO_2NH_2), 1109 (S=O symmetrical stretching of SO_2NH_2), 1038 (C-H in plane deformation of aromatic ring), 919 (S-N asymmetrical stretching of SO_2NH_2), 784 (C-H out of plane deformation of mono substituted benzene ring) 697 (C-Cl stretching), 656 (C-Br stretching); Anal. Calcd. $C_{13}H_{11}ClBrN_3O_4S_2$, C, 34.49; H, 2.45; Br, 17.65; Cl, 7.83; N, 9.28; O, 14.14; S, 14.17; Found: C, 34.51; H, 2.46; Br, 17.66; Cl, 7.85; N, 9.26; O, 14.12; S, 14.15%.

(E)-N-(3-chlorobenzylidene)-(5-chloro, 2, 4-disulfamoyl) benzenamine (3d)

Yield: 58%; MP 230 ºC; MS: *m/z* 408; IR (cm^{-1}): 3364 (N-H asymmetrical stretching of NH_2), 3123 (N-H symmetrical stretching of NH_2), 3011 (Aromatic symmetrical stretching of C-H), 1528 (C=C stretching of aromatic ring), 1376 (S=O asymmetrical stretching of SO_2NH_2), 1113 (S=O symmetrical stretching of SO_2NH_2), 1034 (C-H in plane deformation of aromatic ring), 948 (S-N asymmetrical stretching of SO_2NH_2), 788 (C-H out of plane deformation of mono substituted benzene ring) 676 (C-Cl stretching); Anal. Calcd. $C_{13}H_{11}Cl_2N_3O_4S_2$; C, 38.24; H, 2.72; Cl, 17.37; N, 10.29; O, 15.67; S, 15.71; Found: C, 38.21; H, 2.75; Cl, 17.36; N, 10.30; O, 15.70; S, 15.68%.

(E)-N-(4-chlorobenzylidene)-(5-chloro, 2, 4-disulfamoyl) benzenamine (3e)

Yield: 55%; MP 218 ºC; MS: *m/z* 408; IR (cm^{-1}): 3354 (N-H asymmetrical stretching of NH_2), 3153 (N-H symmetrical stretching of NH_2), 3051 (Aromatic symmetrical stretching of C-H), 1525 (C=C stretching of aromatic ring), 1375 (S=O asymmetrical stretching of SO_2NH_2), 1153 (S=O symmetrical stretching of SO_2NH_2), 1054 (C-H in plane deformation of aromatic ring), 945 (S-N asymmetrical stretching of SO_2NH_2), 7558 (C-H out of plane deformation of mono substituted benzene ring), 687 (C-Cl stretching); Anal. Calcd. $C_{13}H_{11}Cl_2N_3O_4S_2$; C, 38.24; H, 2.72; Cl, 17.37; N, 10.29; O, 15.67; S, 15.71; Found: C, 38.28; H, 2.75; Cl, 17.30; N, 10.32; O, 15.69; S, 15.66%.

(E)-N-(4-methylbenzylidene)-(5-chloro, 2, 4-disulfamoyl) benzenamine (3f)

Yield: 63%; MP 212 ºC; MS: *m/z* 388; IR (cm^{-1}): 3364 (N-H asymmetrical stretching of NH_2), 3128 (N-H symmetrical stretching of NH_2), 3018 (Aromatic symmetrical stretching of C-H), 1521

(C=C stretching of aromatic ring), 1471 (C-H asymmetrical deformation of CH_3 group), 1373 (S=O asymmetrical stretching of SO_2NH_2), 1114 (S=O symmetrical stretching of SO_2NH_2), 1035 (C-H in plane deformation of aromatic ring), 945 (S-N asymmetrical stretching of SO_2NH_2), 764 (C-H out of plane deformation of mono substituted benzene ring) 694 (C-Cl stretching); Anal. Calcd. $C_{14}H_{14}ClN_3O_4S_2$; C, 43.35; H, 3.64; Cl, 9.14; N, 10.83; O, 16.50; S, 16.53; Found: C, 43.33; H, 3.66; Cl, 9.17; N, 10.80; O, 16.53; S, 16.50%.

(E)-N-(4-methoxybenzylidene)-(5-chloro, 2, 4-disulfamoyl) benzenamine (3g)

Yield: 63%; MP 210 ºC; MS: *m/z* 404; IR (cm^{-1}): 3333 (N-H asymmetrical stretching of NH_2), 3133 (N-H symmetrical stretching of NH_2), 3013 (Aromatic symmetrical stretching of C-H), 1523 (C=C stretching of aromatic ring), 1473 (C-H asymmetrical deformation of CH_3 group), 1356 (S=O asymmetrical stretching of SO_2NH_2), 1121 (S=O symmetrical stretching of SO_2NH_2), 1025 (C-H in plane deformation of aromatic ring), 925 (S-N asymmetrical stretching of SO_2NH_2), 724 (C-H out of plane deformation of mono substituted benzene ring), 664 (C-Cl stretching); Anal. Calcd. $C_{14}H_{14}ClN_3O_5S_2$; C, 41.64; H, 3.49; Cl, 8.78; N, 10.40; O, 19.81; S, 15.88; Found: C, 41.68; H, 3.45; Cl, 8.74; N, 10.44; O, 19.89; S, 15.80%.

(E)-N-(4-hydroxybenzylidene)-(5-chloro, 2, 4-disulfamoyl) benzenamine (3h)

Yield: 62%; MP 205 ºC; MS: *m/z* 390; IR (cm^{-1}): 3345 (N-H asymmetrical stretching of NH_2), 3135 (N-H symmetrical stretching of NH_2), 3014 (Aromatic symmetrical stretching of C-H), 1527 (C=C stretching of aromatic ring), 1355 (S=O asymmetrical stretching of SO_2NH_2), 1124 (S=O symmetrical stretching of SO_2NH_2), 1029 (C-H in plane deformation of aromatic ring), 945 (S-N asymmetrical stretching of SO_2NH_2), 720 (C-H out of plane deformation of mono substituted benzene ring), 685 (C-Cl stretching); Anal. Calcd. $C_{13}H_{12}ClN_3O_5S_2$; C, 40.05; H, 3.10; Cl, 9.09; N, 10.78; O, 20.52; S, 16.45; Found: C, 40.06; H, 3.14; Cl, 9.08; N, 10.74; O, 20.57; S, 16.40%.

(E)-N-(4-nitrobenzylidene)-(5-chloro, 2, 4-disulfamoyl) benzenamine (3i)

Yield: 55%; MP 208 ºC; MS: *m/z* 419; IR (cm^{-1}): 3350 (N-H asymmetrical stretching of NH_2), 3109 (N-H symmetrical stretching of NH_2), 3010 (Aromatic symmetrical stretching of C-H), 1559 and 1520 (C=C stretching of aromatic ring), 1489 (Stretching of NO2), 1340 (S=O asymmetrical stretching of SO_2NH_2), 1206& 1100 (S=O symmetrical stretching of SO_2NH_2), 1060 (C-H in plane deformation of aromatic ring), 910 (S-N asymmetrical stretching of SO_2NH_2), 779 (C-H out of plane deformation of mono substituted benzene ring), 681 (C-Cl stretching); ^{1}HNMR: 6.13-6.17 (s, 1H), 7.14 (s, 2H), 7.60 (d, H), 7.95-7.97 (d, 2H), 8.10 (s, 1H), 8.35-8.37 (d, 2H) 8.40-8.45 (d, 1H), 8.49-8.5 (d, 1H); Anal. Calcd. $C_{13}H_{11}ClN_4O_6S_2$; C, 37.28; H, 2.65; Cl, 8.46; N, 13.38; O, 22.92; S, 15.31; Found: C, 37.27; H, 2.67; Cl, 8.49; N, 13.34; O, 22.94; S, 15.29%.

(E)-N-(4-fluorobenzylidene)-(5-chloro, 2, 4-disulfamoyl) benzenamine (3j)

Yield: 61%; MP 214 ºC; MS: *m/z* 392; IR (cm^{-1}): 3344 (N-H asymmetrical stretching of NH_2), 3109 (N-H symmetrical stretching of NH_2), 3010 (Aromatic symmetrical stretching of C-H), 1553 and 1520 (C=C stretching of aromatic ring), 1343 (S=O asymmetrical stretching of SO_2NH_2), 1204 & 1108 (S=O symmetrical stretching of SO_2NH_2), 1068 (C-H in plane deformation of aromatic ring), 916 (S-N asymmetrical stretching of SO_2NH_2), 774 (C-H out of plane deformation of mono substituted benzene ring), 1002 (C-F stretching), 688 (C-Cl stretching); Anal. Calcd. $C_{13}H_{11}ClN_4O_6S_2$; C, 39.85; H, 2.83; Cl, 9.05; F, 4.85; N, 10.72; O, 16.33; S, 16.37; Found: C, 39.86; H, 2.84; Cl, 9.08; F, 4.80; N, 10.75; O, 16.37; S, 16.30%.

CONCLUSION

In height, we include synthesized of inventive Schiff base derivatives using without any problems and appropriate method. This method produces these products in first-class yields and simple workup. Product is isolated by effortless filtration. The isolated products are very unpolluted and do not need any another

purification. This study opens up a new area of valuable synthesis of potentially biologically active description Schiff base derivatives compounds.

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