

Synthesis of (3,4-bis{[2-hydroxy-3-methoxy-5-(4-methylphenyl)azo]benzylidene}-amino)phenyl phenyl methanone as a novel azo Schiff base

A. A. Jarrahpour*, M. Zarei

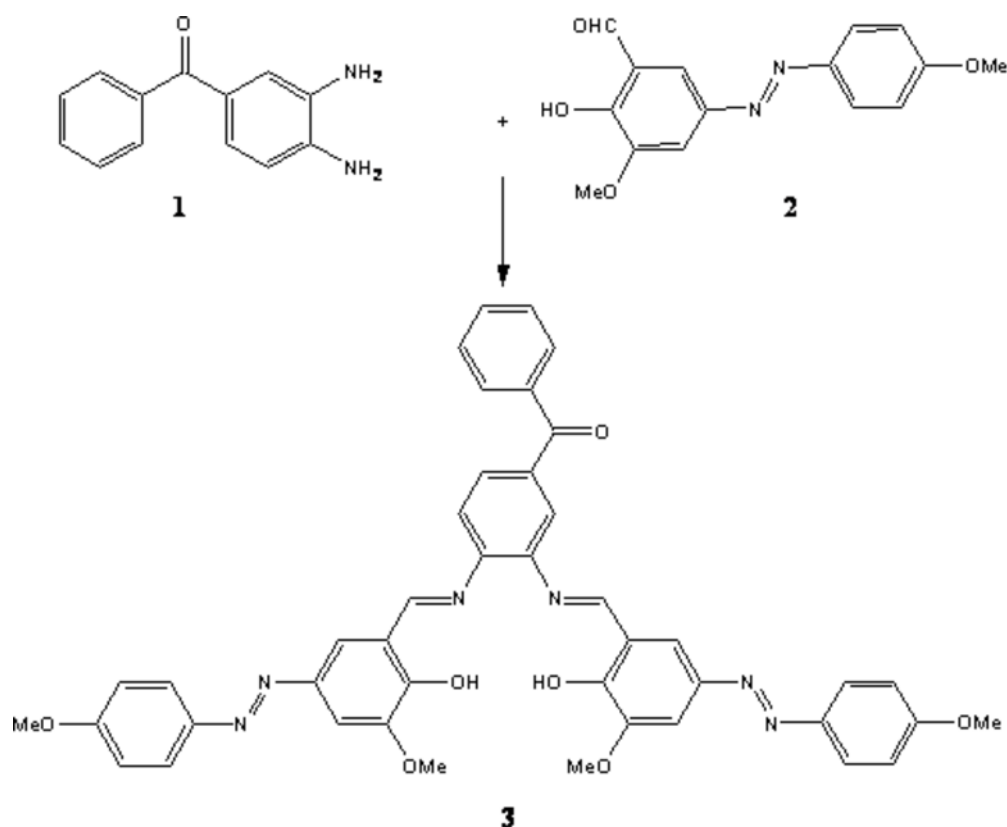
Department of Chemistry, College of Sciences, Shiraz University, Shiraz 71454, Iran Tel. 0098 711 2284822, Fax: 0098 711 2280926

E-mail: aliasghar6683@yahoo.com, jarrah@chem.susc.ac.ir

Received: 16 January 2004 / Accepted: 23 February 2004 / Published: 24 February 2004

Keywords : Schiff base, Azo aldehyde, (3,4-diaminophenyl)phenyl methanone, biological activity, dyes.

Schiff bases are used as substrates in the preparation of a large of bioactive and industrial compounds via ring closure, cycloaddition, replacement reactions, etc [1]. In addition, Schiff bases are well known to have biological activities such as antibacterial [2-5], antifungal [4-6], antitumor [7-9], and herbicidal activities [10]. Also Schiff bases are used as ligands for complexation of some metal ion [11]. Azo compounds are widely used as dyes and pigments [12]. Another area of application of aromatic azo compounds is analytical chemistry where some of these compounds are used as indicators in pH, redox or complexometric titrations [13-14]. On the other hand azo compounds show biological activities containing antibacterial [15-16], pesticidal [10] activities. According to above facts, we decided to synthesize a new azo Schiff base **3** as potential biological and complexometric agent. Its biological activities and its uses in analytical works are under study.



Azo aldehyde **2** was synthesized according to a reported method [17]. To a stirred solution of azo aldehyde **2** (1.08 g, 3.76 mmol) in dry CH_2Cl_2 (30.00 mL) at 0°C were successively added (3,4-diaminophenyl)phenyl methanone **1** (0.40 g, 1.88 mmol) and an excess of anhydrous MgSO_4 (2.00 g, 16.67 mmol). The resulting mixture was stirred for 6 hours at room temperature [18]. The mixture was filtered and washed with dichloromethane. Then the solvent was evaporated under reduced pressure to give azo Schiff base **3** as a red solid which was recrystallized from ethanol 95% (1.28 g, 91 %)

m.p. $140\text{--}142^\circ\text{C}$.

IR (KBr) (cm^{-1}): 1604.7 (C=N), 1658.9 (C=O), 3155.3–3649.1 (OH).

^1H -NMR (CDCl_3) (250 MHz) δ (ppm): 3.91 (2 OMe, s, 6H), 3.98 (2 OMe, s, 6H), 6.89–7.01 ($\text{C}_6\text{H}_5\text{COC}_6\text{H}_3$, m, 8H), 7.24–7.85 ($\text{MeOC}_6\text{H}_4\text{N}_2\text{C}_6\text{H}_2(\text{OH})(\text{OMe})$, m, 12H), 8.70 (2HC=N, s, 2H), 13.89 (2OH, br, 2H).

^{13}C -NMR (CDCl_3) (62.90 MHz) δ (ppm): 56.43, 56.55, 105.73, 114.40, 114.73, 114.13, 118.67, 122.41, 123.13, 124.67, 127.82, 128.65, 130.37, 132.16, 132.40, 133.65, 138.86, 146.00, 147.10, 149.54, 154.23

MS (m/z, %): 492 ($\text{C}_6\text{H}_5\text{COC}_6\text{H}_3\text{N}=\text{CC}_6\text{H}_3\text{OHOMeN}=\text{CC}_6\text{H}_3\text{OHOMeN}$, 3.6), 478 ($\text{C}_6\text{H}_5\text{COC}_6\text{H}_3(\text{N}=\text{C}_6\text{H}_3\text{OHOMe})_2$, 31.9), 464 ($\text{C}_6\text{H}_5\text{COC}_6\text{H}_3\text{N}=\text{CC}_6\text{H}_3\text{OHOMeN}=\text{NC}_6\text{H}_4\text{OMe}$, 2.2), 343 ($\text{C}_6\text{H}_5\text{COC}_6\text{H}_3\text{N}=\text{CC}_6\text{H}_3\text{OHOMeN}$, 11.8), 135 ($\text{MeOC}_6\text{H}_4\text{N}=\text{N}$, 10.7), 108 (MeOC_6H_5 , 100.0), 105 ($\text{C}_6\text{H}_5\text{CO}$, 42.3), 77 (C_6H_5 , 71.8).

Acknowledgment

The authors thank the Shiraz University Research council for financial support (Grant No. 81-SC-1540-C220).

References

1. Aydogan, F.; Öcal, N.; Turgut, Z.; and Yolacan, C. *Bull. Korean Chem. Soc.* **2001**, 22, 476–480.
2. Kabeer, A. S.; Baseer, M. A.; Mote, N. A. *Asian J. Chem.* **2001**, 13 (2), 496–500.
3. El-masry, A. H.; Fahmy, H. H.; Abdelwahed, S. H. A. *Molecules* **2000**, 5, 1429–1438.
4. More, P. G.; Bhalvankar, R. B.; Pattar, S. C. *J. Indian Chem. Soc.* **2001**, 78(9), 474–475.
5. Pandeya, S. N.; Sriram, D.; Nath, G.; De Clercq, E. *IL Farmaco* **1999**, 54, 624–628.
6. Singh, W. M.; Dash, B. C. *Pesticides* **1988**, 22(11), 33–37.
7. Hodnett, E. M. and Mooney, P. D. *J. Med. Chem.* **1970**, 13, 786.
8. Hodnett, E. M. and Dunn, W. J. *J. Med. Chem.* **1970**, 13, 768–770.
9. Nofal, Z. M. N.; El-Zahar, M. I. And Abd El-Karim, S. S. *Molecules* **2000**, 5, 99–113.
10. Samadhiya, S.; Halve, A. *Orient. J. Chem.* **2001**, 17 (1), 119–122.
11. Tai, X.; Yin, X.; Chen, Q. and Tan, M. *Molecules* **2003**, 8, 439–443.
12. Zollinger, H. *Color Chemistry*, second ed., VCH, Weinheim **1991**.
13. Croot, P. L. and Johansson, M. *Electroanalysis* **2000**, 12, 565–576.
14. Choi, D.; Lee, S. K.; Chung, T. D. and Kim, H. *Electroanalysis* **2000**, 12, 477–482.

15. Jolly, V. S.; Pathak, P.; Jain, R. *J. Indian Chem. Soc.* **1993**, 70, 505-507 .
16. Halve, A.; Goyal, A. *Orient. J. Chem.* **1996**, 12(1), 87-88 .
17. Furniss, B. S.; Hannaford, A. J.; Rogers, V.; Smith, P. W. G.; Tatchell, A. R. *Vogel's Textbook of Practical Organic Chemistry*, 4th ed., Longman Inc. New York **1981**, P 716 .
18. Matsui, S.; Hashimoto, Y.; Saigo, K. *Synthesis* **1998**, 1161-1166 .

Sample Availability : Available from MDPI.

© 2004 [MDPI](http://mdpi.org). All rights reserved