

Synthesis of 2-Thiophenyl-3-Substituted Phenyl-4-oxo-Thiazolidine

MOHD. IDREES MOHD. SIDDIQUE*, A.G. DOSHI and A.W. RAUT

Postgraduate Department of Chemistry
Shri Shivaji Science College, Morshi Road, Amravati-444 603, India

4-Thiazolidinones have been reported to possess biological activity. 2-Thiophenylidene substituted aniline, condensed with thioglycolic acid in benzene medium, gives 2-thiophenyl-3-substituted phenyl-4-oxo-thiazolidine. The structure of 2-thiophenyl-3-substituted phenyl-4-oxo-thiazolidine were confirmed by spectral and chemical data.

Key words: Synthesis, 2-thiophenyl-3-substituted phenyl-4-oxo-thiazolidine, characterization.

We observed from literature that most of the compounds having thiazolidinone nucleus possess pharmacological action; 4-thiazolidinones are endowed with a variety of biological activities¹⁻⁵.

Thiazolidinones are also used as sedatives^{6,7}, local anaesthetics^{8,9}, hypnotics^{10,12}, analgesics¹¹ or antitubercular and antispasmodic¹⁴ or anticonvulsants.¹³ Thiazolidinones are employed in the synthesis of merocymine dyes which are used in photographic film industry.

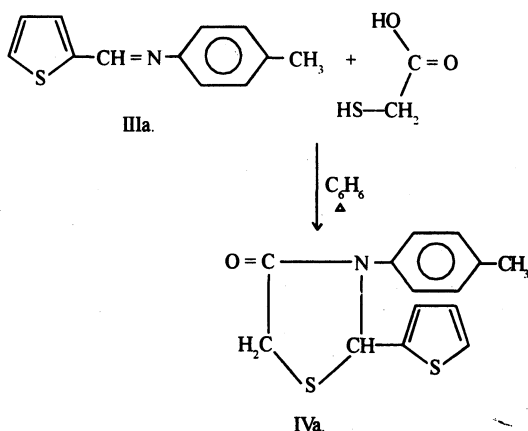
Preparation of 2-Thiophenyl-3-(4'-methyl phenyl)-4-oxo-thiazolidine

A mixture of 2-thiophenylidene-4'-methyl aniline (0.01 M, 2.1 g) and thioglycolic acid (0.01 M, 1 mL) was dissolved in 20 mL benzene. The mixture was refluxed for 2 h on a water bath and allowed to stand at room temperature overnight, the whole mass was treated with saturated sodium bicarbonate solution. The resulting solid was crystallised from ethanol to give compound IVa, m.p. 108°C, yield 80%.

Properties of Compound IVa

It is a broken white crystalline solid compound, m.p. 108°C. From analytical data, m.f. was found to be $C_{14}H_{13}NOS_2$, the molecular weight being 275. UV-Vis spectrum was recorded in methanol. λ_{max} value is 237 nm. It is due to $n-\pi^*$ transition. The IR spectrum was recorded in Nujol. 2911 (C—H stretching in CH_2), 1661 (C=O stretching), 1240 (C—S—C stretching in thiophene), 1190 (C—N stretching), 715 cm^{-1} (C—S—C in thiazolidinone). The PMR spectrum was recorded in $CDCl_3$. 1.6 δ (s, 3H, CH_3), 2.2 δ (s, 2H, CH_2), 6.8–7.3 δ (m, 7H, Ar—H), 9.9 δ (s, 1H—OH). From these spectral and chemical data the compound (IVa) is 2-thiophenyl-3-(4'-methylphenyl)-4-oxo-thiazolidine.

Address for correspondence: c/o Dr. A. W. Raut 25, Keshav Colony, Camp, Amravati-444 602 (M.S.), India.

Reaction:

Similarly other 4-thiazolidinone were prepared by the above method. They are listed in Table-1.

TABLE-1
SYNTHESIS, m.p., YIELD AND COLOUR OF 2-THIOPHENYL-3-
SUBSTITUTED PHENYL-4-OXO-THIAZOLIDINE.

Compound	Name of compounds	m.p. (°C)	Yield (%)	Colour
IV _a	2-Thiophenyl-3-(4'-methyl phenyl)-4-oxo-thiazolidine	108	80	Broken white
IV _b	2-Thiophenyl-3-(4'-chloro phenyl)-4-oxo-thiazolidine	85	75	New ivory
IV _c	2-Thiophenyl-3-(4'-hydroxy phenyl)-4-oxo-thiazolidine	118	68	Chassis grey
IV _d	2-Thiophenyl-3-(4'-benzoic acid)-4-oxo-thiazolidine	158	71	Pale cream
IV _e	2-Thiophenyl-3-(4'-nitro phenyl)-4-oxo-thiazolidine	128	70	Pale yellow
IV _f	2-Thiophenyl-3-(2'-nitro phenyl)-4-oxo-thiazolidine	76	72	Golden yellow
IV _g	2-Thiophenyl-3-(3'-nitro phenyl)-4-oxo-thiazolidine	83	75	Golden yellow
IV _h	2-Thiophenyl-3-(α naphthyl)-4-oxo-thiazolidine	161	71	Broken white
IV _i	2-Thiophenyl-3-(4'-methoxy phenyl)-4-oxo-thiazolidine	90	80	New ivory
IV _j	2-Thiophenyl-3-(2',4'-dinitro phenyl hydrazone)-4-oxo-thiazolidine	220	80	Signal red
IV _k	2-Thiophenyl-3-(2'-hydroxy phenyl)-4-oxo-thiazolidine	105	82	Brown
IV _l	2-Thiophenyl-3-(2'-hydroxy, 4'-sulphonic naphthyl)-4-oxo-thiazolidine	291	80	Wild lilac

REFERENCES

1. K. Ladva, V. Dave and H. Parekh, *J. Indian Chem. Soc.*, **68**, 379 (1991).
2. B.S. Vashi, D.S. Mehta and V.H. Shah, *Indian J. Chem.*, **34B**, 807 (1995).
3. M.B. Hogale, A.C. Uthale and B.P. Nikam, *Indian J. Chem.*, **30B**, 717 (1991).
4. D.M. Viltaria, M. Orazio., P. Eugenio, C. Anionia, G. Federico and B. Adde, *J. Med. Chem.*, **35**, 2910 (1992); *Chem. Abstr.*, **17**, 6228t (1992).
5. D. Pandya and K.B. Naik, *Phermazie*, **48**, 414 (1993); *Chem. Abstr.*, **120**, 10683p (1994).
6. W.J. Doran and H.A. Schonle, *J. Org. Chem.*, **3**, 193 (1938).
7. Forleworks, *Chem. Abstr.*, **52**, 4694 (1958).
8. A.R. Surrey, *J. Am. Chem. Soc.*, **71**, 3105 (1949).
9. F.P. Luduena and J.O. Hopper, *J. Am. Pharm. Assoc.*, **40**, 132 (1952); *Chem. Abstr.*, **45**, 4837 (1951).
10. W.J. Doran and H.A. Schonle, *J. Org. Chem.*, **5**, 194 (1938).
11. E.R.H. Jones, E.A. Robinson adn M.N. Strachen, *J. Chem. Soc.*, 91 (1945).
12. E. Erlenmeyer and V. Metonbary, *Helv. Chim. Acta*, **20**, 1389 (1937); **21**, 1013 (1938).
13. S.A. Towab, *Nature*, **182**, 607 (1959).
14. A.K. Sengupta and Ashok K. Pandey *J. Indian Chem. Soc.*, **65**, 142 (1988).

(Received: 20 August 2001; Accepted: 23 November 2001)

AJC-2537

Biosensors 2002 7th World Congress on Biosensors

KYOTO, JAPAN

15-17 MAY 2002

Contact:

Amy Richardson

Biosensors 2002 Congress Secretariat, Elsevier Science

The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK

Tel: (+44-1865) 843-643

Fax: (+44-1865) 843-958

E-mail: a.richardson@elsevier.co.uk

URL: <http://www.biosensors2002.com>